Sustainability Accounting: a Success Factor in Corporate Sustainability Strategy

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***Abstract*– Over the past decade, the requirements of sustainability were involved into the strategy of many companies. Besides the economic goals, they also determine the exemplary social as well as environmental considerations. However, several empirical studies show that their environmental and social performance only present a slow improvement. Therefore the application of the appropriate management methods and tools are needed to measure the economic, social and environmental impacts of the strategic decisions and activities within the organization.**

The aim of this paper is to study the interaction between the sustainability strategy and sustainability accounting as its key success factor. First, it starts from the conceptual definition of the sustainability and process of the sustainability strategic management. Then, the article introduces the new approaches for the appraisal of the strategic performance beginning with the conventional accounting, through the environmental accounting, to the sustainability accounting. Finally, relating to this, a case study demonstrates the role and contribution of the sustainability accounting to the successful implementation of the sustainability strategy in a Hungarian company.

***Keywords* – Corporate Sustainability, Sustainability Srategic Management, Sustainability Accounting**

I. INTRODUCTION

Sustainability has become a kind of '*mantra*' in the 21st century. It includes the promise of development towards a more equitable society and a richer world in which the natural environment and cultural artefacts are preserved for future generations. *Sustainable development* is a challenge that today's companies also have to address as it significantly affects their strategies. While the idea of sustainability is vividly present in the life of many companies, they still cannot state about themselves that their operation is based on the principles of sustainability due to the lack of sustainability-related *strategies* and the knowledge needed to implement sustainability management *processes* and *methods.*

II. FROM SUSTAINABILITY TO CORPORATE SUSTAINABILITY

A very rich literature is available on *sustainability*, so it is an important task to properly define the content of this concept as a starting point of further examination. After clarifying its content, the incorporation of the conceptual elements of *corporate sustainability* becomes possible.

A. The Dimensions of Sustainability

The philosophy of sustainability derives from the ideas laid down in the so-called Brundtland Report [1]. According to the report, '*sustainable development'* is defined as follows: "Humanity has the ability to make development sustainable to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs (...) Sustainable development is not a fixed state of harmony, but rather a process of change in which

- the exploitation of resources,
- the direction of investments,
- the orientation of technological development, and
- institutional change

are made consistent with the future as well as present needs."

According to a wider interpretation of the above-mentioned definition, sustainable development means the harmonization of economic, social and ecological values. The three "*dimensions*" of sustainability strongly interact with one another, including a variety of factors as shown in Figure 1.

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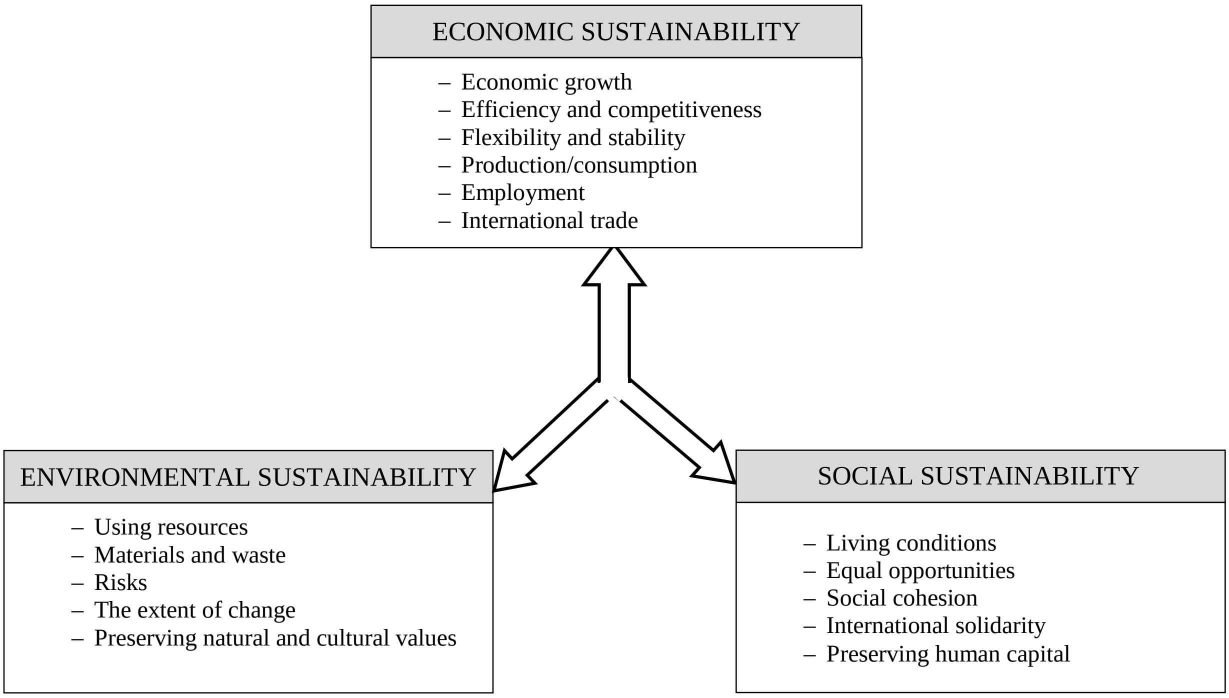

Fig 1 Three dimensions of sustainability

There is no doubt that a complex, multifactorial system is needed for the management of the implementation of sustainability, making the measurement of the achieved results complicated. While improvement is experienced in one dimension, in some cases deterioration can be seen in another one. Usually, there is a debate over whether an overall improvement or deterioration occurred. In addition, it also has to be taken into account that the results achieved at the global level do not necessarily mean efficiency at the level of each and every nation, region, company and individual. However, the established goal has to be the aim of improvement at every level, which, based on our current knowledge, is a major challenge [2].

The issues of sustainability can be discussed at various levels, therefore, they require several different approaches. In this study, the concept of sustainability is associated with companies and examined at the level of companies.

B. The Theoretical Foundations of Corporate Sustainability

In the majority of cases, corporate sustainability is seen as an alternative to the traditional growth and profit maximization model by the corporate executives. In reality, it is a new, emerging paradigm. While acknowledging the need for profitability, it differs from the traditional growth and profit maximization models. It expects companies to keep social and environmental goals in mind, particularly the goals related to sustainable development, such as the environment, social justice and equity, and economic growth.

The concept of corporate sustainability borrows elements from the following four well-established concepts:

- sustainable development,
- corporate social responsibility,
- stakeholder theory,
- corporate accountability.

The relationship between these goals was first presented by [3] shown in Figure 2.

The contribution of *sustainable development* to corporate sustainability is twofold. First, it helps set out the areas that companies should focus on: environmental, social and economic performance. Second, it provides a common societal goal for corporations, governments, and civil society to work toward: ecological, social and economic sustainability.

In the most general terms, *corporate social responsibility* deals with the role of business in society. Its basic premise is that corporate managers have an ethical obligation to consider and address the needs of society, not just to act solely in the interests of the shareholders or their own self-interest [4].

Stakeholder theory defines a stakeholder as “any group or individual who can affect or is affected by the achievement of the organization’s objectives.” The basic premise of stakeholder theory is that the stronger your relationships are with other external parties, the easier it will be to meet your corporate business objectives; the worse your relationships, the harder it will be [5].

The concept of *corporate accountability* refers to the legal or ethical responsibility to provide an account or reckoning of the actions for which one is held responsible. Accountability differs from responsibility in that the latter refers to one's duty to act in a certain way, whereas accountability refers to one's duty to explain, justify, or report on his or her actions [6]. Clarify the reporting requirements to help determine the company's managers and the nature of the relationship between the rest of society.

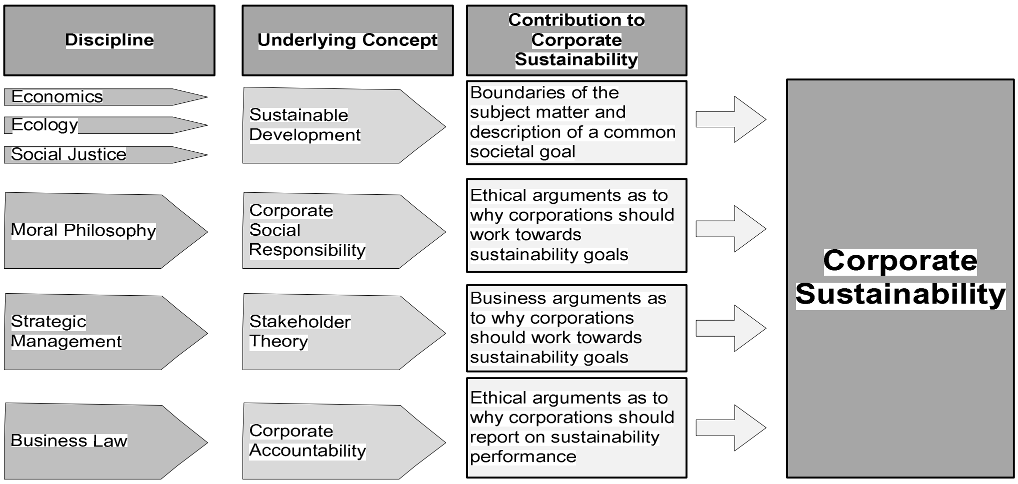

Fig 2 The evolution of corporate sustainability [3]

Based on the above concepts [7],*corporate sustainability* can be defined as follows: "...the economic, social and environmental dimensions of sustainability are integrated into corporate strategies and activities." Therefore it is necessary to secure the sustainable operation of the company from each of the three sides.

– *In economic terms*, a company can be considered to be *sustainable* if – beyond the reimbursement of fixed costs – it fulfils the owners' profitability requirements, with the potential of making some more profit and the addition it brings. The economic turning point comes when all costs are paid back and the profitability requirements of the company are also met [8].

– *In social terms*, companies operating *in a sustainable way* make their contribution to social value creation through increasing individual human capital and supporting social goals. They manage social capital in such a way that stakeholders can understand its motivations and can broadly agree with the company's value system [9].

– According to the *ecological approach*, sustainable companies are characterized by the rational exploitation of natural resources and the aim to minimize the damaging environmental impact of their production activities. All of these are done to preserve the quality of natural resources as well as the economic opportunities offered by them [10].

Currently, not all companies operate in line with the principles of sustainability. However, many companies are publicly committed to the practical implementation of sustainability strategies and the adoption of appropriate management methods and tools.

III. THE PROCESS OF SUSTAINABILITY STRATEGIC MANAGEMENT

The dimensions and principles of sustainability open an opportunity for a conscious creation of sustainability strategic management process together with the formulation and implementation of a *sustainability strategy*. According to *Bieker's and his co-authors'* wider interpretation, it puts special emphasis on the statement that *corporate strategies have to meet the expectations of the company's present and future stakeholders without making any crucial compromises in terms of skills and capabilities* [11]. Reference [12] came up with a more accurate formulation, according to the sentence that "sustainability strategy puts emphasis on such responsible corporate activities that regard the issue of sustainability as development and growth opportunities for the company, and as such, they are enforced in all fields of activity." It means that a certain system of advantages and disadvantages should be developed by which corporate actions can be steered in the desired direction.

Sustainability strategic management enables companies to develop and apply strategic methods and tools by which environmental protection and people's well-being can be ensured. This notion is expressed in a [13] definition as follows: "On the one hand, sustainability strategic management establishes a link between social, environmental and corporate management and the strategy itself, on the other hand, it integrates the social and natural environmental information with the company's management information and sustainability report."

Translating it into "everyday language", it means that the definition of such general corporate functions makes the company and its strategic management sustainable if they are performed:

– the principles of the relationship to the social and natural environment principle should be reflected in the company's mission, values and vision,

– social and environmental impacts has to be taken into consideration,

– it should use international social and environmental standards in its management system,

– specific social and environmental goals and performance measurement should be determined and assessed regularly,

– the main areas of responsibility should be identified, and appropriate systems should be operated for the control and implementation of the decisions made in these areas.

It is can be easily seen on the basis of the above definitions that the elements included in the strategic management of sustainability are highly situational. However, we believe that the process of sustainability strategic management, its main activities can still be determined as illustrated in Figure 3 based on [14].

In the process, those phases and activities are presented where social and environmental aspects can be taken into account and the expected sustainability performance is influenced to the greatest possible extent during their implementation.

A. Strategy-making

Three major elements have to be integrated in the process of sustainability strategic management at the same time: *strategy-making*, *strategy implementation* and *feedback*. The first phase of the *strategy-making process* mainly serves the better foundation and effective implementation of *decisions having strategic importance*. In doing so, *the internal changes of a company* have to be determined *for the sake of sustainability* while the nature of social and environmental changes should be understood more profoundly. In order to meet this requirement more easily, it is advisable to divide the complex work of formulating a sustainability strategy into four distinct phases in the following: the definition of strategic inputs, strategic analysis, creating strategic alternatives and evaluating and selecting strategic alternatives.

1) The definition of strategic inputs:

The first three elements of strategic inputs – the company's mission, values and vision –describe the company's *internal conditions*. These are linked to the company's strategic intent together with its strategic target system. The company's ability to realize its intent and reach its strategic goals of sustainability mainly depends on the influence and the *external changes* of social and environmental expectations.

The *company's mission* states the reason for the company's existence, what its aspirations are, whom and how it intends to serve, what social and environmental values it believes in and which distinctive characteristics it considers.

Components of the *organizational values* are derived from the corporate culture that creates a unique "state of identity" for the employees of the company and the broader society, social public opinion.

The *vision* records a required future state outlined by the company, which is built on general corporate values, which is open and very often at odds with the present [15]. It is a strategic tool that connects all employees of the company and strengthens their commitment towards strategic intents and goals.

On the one hand, the *strategic intent* – according to [16] – designates a desired market position and establishes the criterion that measures the progress of the organization. The company's strategic intent should be consistently enforced during the planning of the hierarchy of strategic objectives.

In [14] interpretation, *strategic goals* have to deal with the available economic, social and environmental position in accordance with the dimensions of sustainability, where the expectations related to the given situation and the target levels of various sustainability performance indicators have to be formulated.

Determining these strategic inputs in advance often proves to be difficult mainly because a sustainability strategy, at least in an explicit form, is not available.

2) Strategic analysis:

The analysis of the company's current and future situation, *on the one hand*, means the timely recognition of both social and natural environmental requirements and taking into account the anticipated increasing pressure from stakeholders, which requires the continuous analysis of regulations as well as the values of the social and natural environment (*external factors*), *on the other hand*, it also assumes that the company is aware of its own internal resources and activities (*internal factors*) and it continuously evaluates their social and environmental impacts.

The external factors of the analysis

While analyzing the situation of the company, those external factors are described above all in that they shape the company's general and competitive environment in the long run. This means the analysis of *environmental trends and threats*, which covers a better understanding on the *legal*, *economic regulatory framework* (*laws, standards*), *market constraints* (customers, public opinion) and *emerging opportunities* (cost reduction, product / service). These external factors must be naturally and constantly evaluated from the aspect of the future of corporate sustainability.

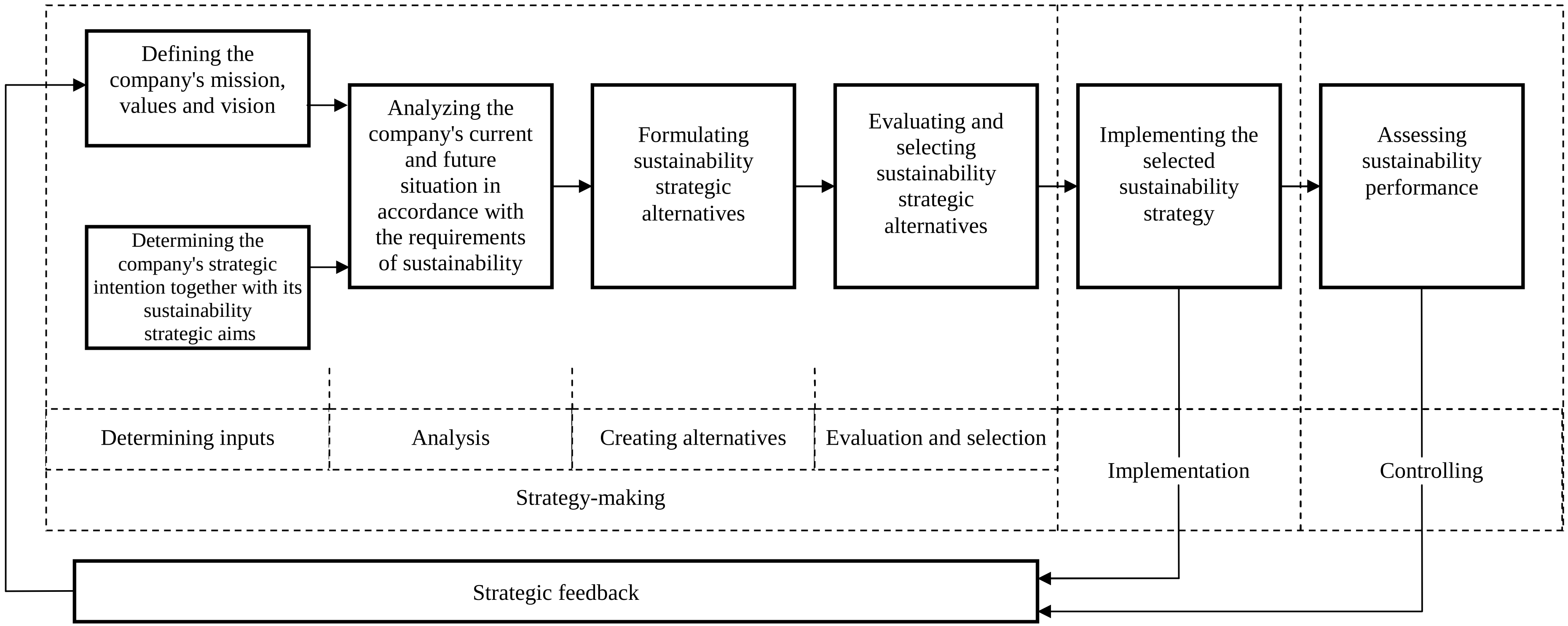

Fig 3 The process of sustainability strategic management [14]

The internal factors of the analysis

A company responds to the social and environmental challenges by relying on its internal resources and own activities. Therefore the examination of the *internal resources* and *business activities* is an essential part of the strategic analysis.

− *Internal resources*

During the earlier development of the company, it accumulates a vast range of resources. Among these resources, there are *manual* and *technological* ones, other resources built on *human knowledge*, *organization* and *culture*, and ones that are formed upon the *public perception* of the company and *financial* resources as well. However, these resources do not produce values by themselves but by the complex interconnectedness to one another. The value of internal resources together with their quantitative and qualitative parameters can be determined by a *resource analysis*. *The resource analysis aims to identify the assets available to the company and explore the environmental impact of their use upon which they implement sustainability strategy*.

For socially and environmentally oriented companies, not only the existence, the value and income-generating capacity of resources but their contribution to sustainability is also important. These opportunities are listed in [17] study, though their detailed review is disregarded here.

− *Own activities*

The examination of *own activities* is important because it helps to understand that the company is more than some random set of tools, capabilities, equipment, people and financial resources. These resources can make sense when they are organized into value-creation system and produce as much value for the potential customers as possible. The general efficiency criteria for the system of corporate activities are well-known: cost, quality, reliability, flexibility and customer service. These criteria are not sufficient now; they must also be combined with the components related to the assessment of the social and environmental goods.

In the course of the socially and environmentally oriented analysis, evaluation and planning of the system of corporate activities, it is practical to concentrate on those core activities that are the most important and offer the biggest savings opportunity in terms of sustainability. These activities are:

– *marketing* (environmental or green marketing),

– *innovation* (products with high social and/or environmental value, development of technologies),

– *human resource management* (knowledge management of managers and employees for the good of the organization's objectives),

– *logistics – material flows and stocks* (green procurement, environmental waste management),

– *production and services* (green, otherwise cleaner production),

– *finance* (environmental or sustainability accounting).

Finance is a range of activities that extends to all areas of the company's operation, so when a financial analysis is performed, actually the company's entire operation is discussed. It is not easy to collect useable data for this purpose. The main producer of social and environmental information is *sustainability accounting* that can also be regarded as the basis for the sustainable business operation of a company. The elements of this accounting activity and the information content of the reports associated with it make it possible for us to conclude to the sustainability-oriented nature of the company's financial activities, which is a way of thinking that plays a prominent role in the strategic analysis, especially at the time of an economic recession.

3) Strategic alternatives:

In the strategic analysis mentioned in the previous point, the internal and external factors determining the company's sustainability strategy can be examined along with its capabilities and opportunities. Based on the results of the analysis, it becomes possible to formulate a *deliberate strategy or strategic alternatives*, explicitly expressing the company's basic position on the subject of sustainable development. Following their first empirical research, the types of competitive sustainability strategies were defined [11] in accordance with the *strategic orientation* and the *strategic behaviour* of companies.

The *orientation* of a strategy can be classified by that one of the two prominent actors of the company’s external stakeholders, either *the market or the public*, is in the centre of the company’s strategy. While *market-oriented strategies* are designed to satisfy market needs in a better way, the main purpose of *public-oriented strategies* is to comply with societal expectations to the highest possible degree.

In terms of *behaviour*, [18] and [19] make a distinction between the possible strategies of organizational behaviour based on two defining characteristics: strategies can be reactive and proactive. *Reactive strategies* give response to legal and economic changes later in time; they are characterized by follow-up reactions. On the contrary, *proactive strategies* take the opportunities provided by sustainable development as a challenge and exploit them to strengthen their strategic position. If the aspects of orientation and behaviour are linked together, the following types of sustainability strategies can be constructed as illustrated in Figure 4.

Strategic orientation / **Strategic behaviour**	**Public**	**Market**
Reactive	“Credible” strategy	“Efficient” strategy
	“Safe” strategy	
Proactive	“Transformative” strategy	“Innovative” strategy

Fig. 4 The five different types of sustainability strategies [11]

The aim of *Strategy "safe*" is to reduce, avoid or handle the company's overall operational risk.

The aim of *Strategy "credible"* is to preserve and enhance credibility and corporate reputation.

Strategy "efficient" is designed to improve the social or environmental effectiveness of business processes.

Strategy "innovative" is aimed at increasing the range of socially and environmentally-friendly products and services.

The aim of *Strategy "transformative"* is to develop new markets and restructure already existing markets.

These five strategies are applicable both on corporate and divisional levels, furthermore, they can also be successful with certain products or technologies. However, this classification seems idealistic as these strategic alternatives may overlap in practice, and no clear distinction can be made between them.

4) The evaluation and selection of strategic alternatives:

We quickly followed the way in which a company acquires accurate knowledge on its macro- and micro-environment, its resources and its intentions, and we identified the possible strategic alternatives. For choosing from the range of strategic alternatives, it is not sufficient to define the possible directions of strategic development or strategic options, a system of criteria helping the managers responsible for making strategic decisions has also to be designed.

According to [20], the general criteria for the evaluation of strategic alternatives are *suitability*, *feasibility* and *acceptability*.

The assessment of *feasibility* is based on whether the necessary conditions for the implementation of the strategy alternatives are available.

Acceptability refers to the extent of how effectively a given strategic alternative results in the solution of a problem that comes to light.

In order to determine *suitability*, the strategic alternatives have to be evaluated from the aspects of the company's core capabilities, together with its organizational and cultural characteristics and environmental conditions.

In addition to the general aspects, the selection process of the sustainability strategy alternatives has *specific factors* as well. The purpose and the content of the sustainability strategy are related to the driving forces resulting from the company's macro- and micro-environment or rather from its essential corporate capabilities and needs. These specific factors are summarized in Table 1.

TABLE 1 THE MAIN FACTORS FOR SELECTING ALTERNATIVE SUSTAINABILITY STRATEGIES [21]

External driving forces	**Internal capabilities and needs**
– Sectoral or market structure in which a company operates (e.g. characteristics of competition, markets, products, consumers, suppliers and input prices) – Other forms of driving forces and societal expectations (e.g. social organizations, interest groups, local communities) – Economic network (e.g. interdependencies, product lines) – Rules, regulations and standards, general requirements, increased expectations waiting for the company to be fulfilled – Local/global social and environmental risks, effects and opportunities (e.g. local sensitivity, technological changes)	– Economic characteristics and capital resource availability, including the company’s financial position, the costs of social and environmental management, the tangible and non-tangible resources, company-specific competitive advantages and strategic goals (e.g. goals related to profitability, market share, the degree of vertical integration, diversification and globalization) – Company-specific human resources and capabilities (e.g. specific social and environmental awareness, new products/processes) – Organizational structure and flexibility – Technological factors – Internal social and environmental risks, effects and opportunities – Management system (e.g. management style, commitment, interests, aims, remuneration system) – Corporate traditions (e.g. mutually accepted behaviour norms) – Corporate ethics

B. The Implementation of The Strategy

The second main phase of the process of sustainability strategic management is the implementation of the strategy which typically involves such tasks as action planning, defining the necessary resources, organization restructuring, management and leadership. Due to the limited space, we set aside the detailed description of these activities, however, we do mention the *context* that mainly influences the introduction of strategies (small-sized companies, multinational and manufacturing companies, public utility companies as well as voluntary organizations).

In *small enterprises*, the values and expectations of the managers – and the owners – have the greatest importance. Another characteristic of small enterprises is that – unless they specialise in a certain market segment – they are exposed to fierce competition. Small enterprise strategies are also influenced by the fact that the possibilities for growth and capital intake are limited. In the implementation of the strategies of small enterprises, the main roles are determined by the selection of a suitable, *socially-oriented* and *environmentally-conscious target market* and securing the *financial sources* to cover the companies’ higher expenses.

Different business units of m*ultinational and global companies* are varied in terms of products and markets. As a result of this, the main strategic questions for multinational and global companies are:

– organizational structure and management at a corporation level, and

– the relationship between the parent company and its subsidiaries.

The main strategic challenge for parent companies, from the environmental point of view, is the allocation of resources of business units with different needs and the coordination of logistic between the different countries.

In the centre of a *manufacturing company*, there is the tangible product. Consumers, however, may find the products of different manufacturers very similar to each other. Thus, these companies can gain competitive advantages through the provision of supplementary services or through their brand names. The competitive advantage gained by using such methods is the reason why the satisfaction of more socially-oriented and environmentally-conscious consumer needs is the focus of production and service company strategies.

Public utility companies provide services to their customers in the same way as their counterparts in the competitive sphere. However, the role of politics is more important in the public sector with regards to implementation of strategy because it provides services that private companies do not or cannot provide. Thus, this sector – operating in a typically political environment – is aimed at acquiring crucial resources. The emphasis has shifted to the environmental cooperation of public institutions, with the hope that their work will bring bigger environmental benefits for society.

Financial resources are varied in *voluntary organizations* and they are not supplied by the direct beneficiary. It leads to the substantial presence of political lobbies, and to centralize their strategic decision-making and responsibility-taking. In the context of volunteer organizations, other important factors can be paying attention to environmental protection, broadening the knowledge of sustainability, and setting an example for society.

The environmental characteristics and impacts of implementing the sustainability strategy are often neglected by companies, which, in turn, threaten their success.

C. The Sustainability Performance Assessment, Strategic Feedback

For an organization, an essential part of the implementation of the strategy is to "keep its eye on the target". It means the *monitoring*, *evaluation* and *feedback* on the sustainability performance.

A series of factors also refers to their importance that can be found in the conditions of the activities of virtually every organization [22]:

– the increasing difficulty in the predictability of environmental conditions,

– the increasing complexity of the external environment (driving forces) and internal condition system (capabilities and needs),

– the lack of human knowledge, limitations of skills,

– the general transfer of work tasks and expanding decentralization.

Strategic monitoring and feedback have certain specific characteristics as well. These characteristics originate from the fact that the sustainability strategy basically focuses on trends in the long term and aims to influence them. Thus, its realization has to be followed up for a relatively long period of time. *Monitoring and evaluation* are intended to adjust the organization's sustainability strategy to the ever-changing conditions and to the changing social and environmental demands. The *strategic feedback* is the information on the changes in certain subareas or in the whole organization of the company as well as on the changes of the social and natural environment, and it has the potential to start adapting or redefining the sustainability strategy. This feedback closes the circle of sustainability strategic management and provides *the initial impetus* for starting the redefinition of the necessary strategy. This feedback is the basis for the *motivation* related to the strategy, thus enabling the organization to *continuously improve its performance*. All of these can only be conceivable if the appropriate information is available for the management on the course of the implementation of the strategy, the achieved sustainability performance and the occurring problems. In the modern organization of a company, a *sustainability accounting system* gives the basis for receiving information on monitoring, evaluating and giving feedback; its development history is described below in detail.

IV. A NEW APPROACH TO STRATEGIC PERFORMANCE EVALUATION SUSTAINABILITY ACCOUNTING

In the course of sustainability strategic performance evaluation, companies need to build up and operate an accounting information system that meets the requirements of sustainable development. The development stages of accounting towards this direction are described below.

A. Changes in Traditional Accounting

Traditional accounting systems are information systems supporting the daily operation of economic organizations, with the purpose of observing, collecting, recording, measuring, classifying the economic events that have an effect on the company's assets, financial and earnings position, together with their impact. Therefore, the aim of accounting for stakeholders (owners, managers, creditors, inspection bodies etc.) is to provide accurate information for future decisions making.

The modern approach to traditional accounting can be divided into two areas: financial accounting and management accounting. Financial accounting provides external stakeholders with information by financial reports through *"the changes in the tools and resources required for the management as well as the accounts of the economic performance"*, its practical implementation is regulated by the Act on Accounting. Whereas management accounting is "*the complex of decision support methods and procedures, satisfying the information needs of the various management levels and internal users"*, its task is to identify, estimate, analyze, and provide cost and other internal information for the management [23].

In the light of corporate sustainability, however, the generally accepted accounting principles, the range of those demanding accounting information and the content of accounting information have to be reinterpreted.

1) A new approach to the going concern principle:

One of the most fundamental principles in accounting is the going concern principle, which states that *"in the course of book-keeping and preparing the accounts, it must be assumed that the enterprise will maintain its operation in the foreseeable future, will be able to carry on its activities, and a significant decrease or closing down its activities is not expected for any reason*"[24]. This is the reason why it has to be treated with utmost importance as it is the basis for the realization of the other accounting principles. This accounting principle refers to the existence of the economic conditions of operation, since traditional accounting handles business organizations as a closed system or an autonomous entity, pulling them out of their social and natural environment [25]. In contrast, corporate sustainability assumes that the company can only be successful in the long run if it does not ignore the impact on society and on the natural environment, and conversely, the social and environmental impacts on the company. The problem lies in the interpretation as this wording suggests that only a stable external environment allows the companies' activities on an unchanged continuation, and assumes what is also emphasized in [26] work, namely, observing the going concern principle results in keeping the companies' operations maintainable. However, a company's external environment should include the business (economic) environment in which it operates, the local and regional social environment in which it is located, and the natural environment, which, in turn, gives a natural limit to the company's operations [27].

2) Reconsidering the content and the range of those demanding accounting information:

Since the information provided by accounting systems are suitable for preparing and establishing decisions, that is why it is important to make the demanded information available. However, it would be reasonable to give an extended interpretation on the range of stakeholders. Therefore, according to [27], the population, meaning society itself, the natural environment, especially at local and regional levels, as well as future owners, employees, the next generations, and the future state of the natural environment all have to be taken into account. After all, the point of sustainability focuses on their needs in order to make all those decision-making opportunities accessible to them that are currently in place for present-day stakeholders.

The fundamental task of accounting is to provide reliable and real information on the operation of the company for market participants. However, different information is needed by different stakeholders. Therefore, an accounting information system should be established that is capable of collecting, organizing the social and environmental information necessary for making various decisions, and is capable of presenting and interpreting them to both internal and external users in a reliable and accurate way. In response to these changing requirements, traditional accounting systems have to change and improve accordingly. The next step of this improvement is the development and the implementation of environmental accounting systems.

B. The Characteristics of Environmental Accounting

The concept of *environmental accounting* and reporting appeared in the literature nearly a decade ago. According to [28] definition, *"environmental accounting can be defined as a field of accounting that includes those activities, methods and systems that record, analyse and report on the environmental problems of a given economic system or on the economic impacts of environmental protection activities".* Environmental accounting systems basically consist of two parts, one of them deals with the environment-induced financial impacts, i.e. environment-related expenditures and savings, while the other part is concerned with the environmental impacts of the company's business, that is, how the natural environment changes as a result of the company's operations [25]. Environmental accounting systems present the above-mentioned effects both by measuring in natural units and expressing in terms of money, as – opposed to traditional accounting – non-monetary and qualitative factors are also strongly emphasized here.

Thus, basically there are four areas of environmental accounting [29]:

– *Internal ecological accounting* puts emphasis on analyzing the changes in the natural environment due to corporate activities. It is based on the environmental performance evaluation, which is *"the continuous measurement and evaluative analysis of the environmental performance"* [30]. Many methods can be used for measuring environmental performance, ranging from simple, underlying methods to more complex synthetic ones, and these are basically natural units indicating the effects of corporate operation on the natural environment.

– *Environmental management accounting* focuses on the environmental costs, expenses and revenues, and the collection and analysis of savings opportunities as well as the preparation of internal reports, thus supporting the rational decision-making of the management. After all, environmental performance is not only measured in natural units, but their expressed value is also an important source of information for the management.

– *External ecological accounting*, in a similar way to internal ecological accounting, takes into account the environmental impact of the company measured in natural units, and compiles reports from these data to external users. One of its efficient tools is environmental reporting, which is *"...the complex of information on the environmental impacts and operational performance presented by a legal entity..."* [31].

– *Environmental financial accounting* prepares reports to external stakeholders on the company's environmental liabilities and costs that affect the company's financial position, in other words, it presents changes measured in units of money. The presentation and the publication of some environmental aspects in the annual report are also regulated in the Hungarian Act on Accounting.

"So ecological accounting facilitates establishing a connection between environmental and economic performance together with the presentation of the interaction between these two types of performances" [32].

By focusing on the company's financial and environmental dimensions, environmental accounting systems ignore the impact of corporate activities on society. However, there are approaches [33] that interpret society as part of the natural environment and think the sustainability of the natural environment is the basis of the human well-being, therefore, they should not be treated separately. However, according to the conclusion of the present paper, these three dimensions must be taken into account in the development of accounting systems, giving way to sustainability accounting systems.

C. The Theoretical Framework of Sustainability Accounting

Borrowing the notion made by [34], *sustainability accounting* is the peak of accounting. Sustainability accounting, reaching far beyond environmental accounting, examines business operations by putting all three – economic, social and environmental – dimensions into its focus, and most importantly, it emphasizes the interaction of these dimensions in accordance with corporate sustainability.

Several studies can be found in the literature that makes an attempt to identify the essence of sustainability accounting. There are more definitions for sustainability accounting, in some cases the expression even appears in the titles of the studies, although it turns out later that it is used in a different meaning. An example of this is the study of [35] where a brief evolution of sustainability accounting is presented, whereas the concept of sustainability accounting is used in the meaning of environmental accounting. According to [36] and the publication of [37], sustainability accounting is a tool that makes it possible to quantify the effects of corporate activities on social communities and the natural environment in financial terms, thus it only focuses on the financial manifestations of sustainability.

The most widely accepted definition was presented by [38]:

"Sustainability accounting is a part of accounting that includes those activities, methods and systems that record, analyse and report on the following connections between the companies and sustainability:

– *the environmental and social impacts induced by financial effects,*

– *the effects of corporate activities on the environment and society,*

– *the interactions and relationships between the economic, social and environmental issues that form the three dimensions of sustainability."*

It can be legitimately asked whether sustainability systems should be treated as completely self-contained, new accounting systems or as part of, as an extension of traditional accounting systems. According to [7], the former alternative would be desirable, as it gives opportunities to the actual mapping of the economic, social and environmental risks and benefits, and to the integration of these dimensions into the company's accounting system. Most of the authors, however, believe that the latter approach is closer to the actual practice, since the gradual modification and expansion of the existing accounting system causes a minor change in the company's strategic management process.

The development of a sustainability accounting system includes the following *five elements*: the aim of operating a sustainability accounting system; the principles and requirements of operating the system; methods and devices for data collection, data record, measurement and analysis; sustainability accounts and reports; and the qualitative characteristics of the resulting information [35]. The components of the logical model of sustainability accounting systems as well as the relationships between them are shown in Figure 5.

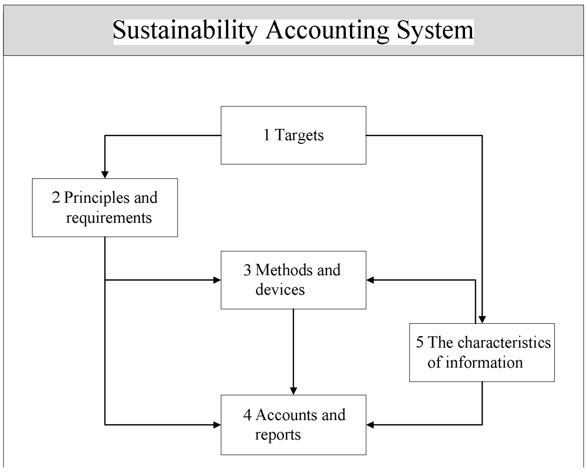

Figure 5 The logical model of sustainability accounting system [35]

1) The aim of sustainability accounting systems:

Sustainability accounting information systems are ***primarily designed to*** evaluate the performance of the economic organization in terms sustainability, i.e. paying special attention to its economic, social and environmental aspects. Similar to traditional accounting, sustainability accounting can also be divided into two areas according to whether it provides external or internal users with necessary information.

The external stakeholders' need for information focuses on the accountability of the organization's operations both in social and environmental terms. In addition to this, sustainability accounting information systems provide internal stakeholders, the management with information relevant to the decision-making, thus playing an important role in strengthening the internal management of the organization. As it is possible to determine the effects and consequences of the measures taken to achieve sustainability objectives in the course of performance evaluation, it gives a good basis for the preparation of a possible intervention, that is, for controlling and feedback.

2) The principles and requirements of operating a sustainability accounting system:

During the development of a sustainability accounting system, some important *principles* and *requirements* should be taken into consideration the methods and devices specification applied in the course of data collection, measurement, and evaluation, as well as the content and the process of reporting.

The sustainability accounting system is elaborated at a corporate level, therefore, it applies to *economic organizations obliged to prepare reports* and it is not relevant at the macro level.

As already mentioned, with the reinterpretation of the going concern principle, existing *accounting principles* also gain new meanings both in social and environmental terms. Reference [35] highlights one of those principles, namely the principles of sufficiency. According to his approach, it is not possible to record and analyze all impacts on society and the natural environment, thus, those impacts should be put forward that pose potential threats to mankind and the natural environment or the ones that are essential for the company's strategic decisions.

The following principle is *the interpretation of sustainability at a corporate level*. It is an important issue because it determines the framework of the whole system. The company's sustainability goals, the compound realization of economic, social and environmental sustainability raise the issue of their integrated measurement and performance evaluation. Due to the complexity of the company's sustainability performance evaluation*, the boundaries of the sustainability accounting system* have to be clearly marked in a way that it still could be managed by the company. It has three levels. First, the essential inputs and resources have to be taken into consideration which influence or incidentally limit the operation of the company, then the direct effects of the company's activities on the society and the natural environment, that is the outputs, but the supply of inputs, in other words, the environmental and social performance of suppliers also have to be taken into account [35].

The following essential requirement is the selection of the proper period for accounting, evaluation and analysis, that is, the determination of the *period* when the company is evaluated in terms of sustainability. It is advisable to choose a monthly, quarterly or annual period in accordance with the traditional accounting standard. However, resulting from the implementation and controlling of the sustainability strategy, the sustainability accounting system needs to be applied in a longer time frame since it has to take into account the social and environmental impacts of the company's products and services through their entire life-cycle.

The evaluation of the social and environmental impacts caused by corporate activities or the entire life cycle of a product requires the application of non-monetary, qualitative *indicators* beside the usual monetary indicators for measuring economic or financial performance.

3) Methods and devices for data collection, data record, measurement and analysis:

The sources used for collecting and recording data are wide-ranging and abundant, however, in the selection process some cost-benefit aspects should be enforced.

Based on the collected economic, social and environmental data, it becomes possible to measure the company's sustainability performance, and it requires *a variety of benchmarks* and *evaluation methods*. Some of these are the cost estimation of decision alternatives regarding corporate sustainability [39], input-output analyses, life cycle analyses, and the mapping of social and environmental impacts. One of the most complete methods available for the management is the Sustainability Balanced Scorecard (SBSC), an integrated indicator system aimed at evaluating the company's performance [40], which is the basis for decision-making and monitoring the realization of objectives.

Considerable attention should be paid to the evaluation of environmental protection measures, the costs of social and environmental liabilities in order to make the company accountable in terms of sustainability.

4) Sustainability accounts and reports:

The fourth part of sustainability accounting focuses on distributing both quantitative and qualitative information to users. Here, there are two key questions to be answered. What is the appropriate form and content of a *sustainability account*? How often should these *reports* be prepared and published?

Sustainability accounting information are presented by the SBSC including a wide variety of performance indicators, and other sustainability reports based on the guidance of the Global Reporting Initiative (GRI).

Such reports should be made regularly through the entire lifetime of a product. It is reasonable to present and publish the company's accounting information related to sustainability on its website. The sustainability of the company's accounting information should be presented and published on the website, thus these continuously updated information on sustainability can be promptly available to the stakeholders.

5) The qualitative characteristics of information on sustainability:

The information provided by sustainability accounting systems has to meet a number of important requirements, which are based on the *characteristics of traditional accounting information*, as well as on the guidelines of GRI sustainability reports. The two highlighted features are transparency and controllability. *Transparency* demands the complete publication of processes, procedures and assumptions [41]. *Controllability* requires that the recording, organizing, analysis and publication of the presented data and information should be done in a way that enables auditors to certify data reliability [41].

The further requirements concerning sustainability information are: completeness, credibility, neutrality, clarity, materiality, timeliness, comparability and readiness for interpretation in the context of sustainability.

It is reasonable for companies to design and operate sustainability accounting systems in compliance with the requirements of sustainability since it is a kind of financial language for decision-makers. According to [42], sustainability accounting is a bridge, which leads the company to the bank of a sustainable operation and behavior. The main characteristics of the different accounting systems are summarized in Table 2.

Since traditional, environmental and sustainability accounting systems examine the company's sustainability performance through different dimensions, the content of the obtained information is also different from one another, giving different tasks to the particular accounting systems. The modified range of tasks is noticeable in the areas and the applied methods of the accounting systems. Despite the fact that there is no compulsory standard for the operation of sustainability accounting systems, these requirements will certainly appear in the long term.

TABLE 2 THE COMPARISON OF THE CHARACTERISTICS OF TRADITIONAL, ENVIRONMENTAL AND SUSTAINABILITY ACCOUNTING SYSTEMS [27]

Aspects for comparison	Traditional accounting system	Environmental accounting system	Sustainability accounting system
Dimension	– Economic (financial) situation	– Relationship between economy (company) and environment	– Integrating economy (company), society and environment
Target	– Presenting general economic situation – Cost management	– Presenting environmental performance – Presenting environmental liabilities and costs	– Presenting sustainability performance (including economic, social and environmental performances)
Field of application	– Financial accounting – Management accounting	– Environmental financial accounting – External ecological accounting – Environmental management accounting – Internal ecological accounting	– Sustainability financial accounting – Sustainability management accounting
Method	– Evaluation processes – Cost accounting	– Evaluating environmental performance – Life-cycle analysis – Analyses on environmental costs and savings	– Evaluating sustainability performance by applying the methods of other disciplines (biology, sociology) – Sustainability Balanced Scorecard

Unit of measurement	– Money (inventories excluded)	– Money and natural units	– Money and natural units
Forms of accounts	– Financial and accounting reports – Internal reports	– Environmental reports and accounts	– Sustainability reports and accounts – Global Reporting Initiative
Regulation strictness	– Compulsory due to legal regulations (financial accounting) – Voluntary (management accounting)	– As part of the Act on Accounting, some reporting requirements on environmental performance	– Not regulated, voluntary

D. The Relations between Sustainability Strategy and Sustainability Accounting

Sustainability accounting systems must primarily meet the needs of the top management. Accordingly, the function of a sustainability accounting system is to identify, collect, analyze, and communicate feedback on the company's economic, social and environmental performance. In order to achieve this

– As a first step, the *identification* of those strategic and operational indicators should be carried out that are crucial to the success of the business and the creation values for stakeholders [43]. In other words, in accordance with its sustainability strategy, the company has to systematically choose the appropriate goals of sustainability performance indicators, their structure and their information needs also should be planned.

– In the next step the required quantitative and qualitative data *should be collected* that include social and environmental costs, expenses and risks, then the financial benefits and savings of sustainable business operations, and finally, the natural effects on the society and the environment. These can be acquired either directly or indirectly by taking cost-benefit aspects into consideration.

– The third step is *to analyze* the company's sustainability performance, and then to monitor whether the company has met its strategic and operational objectives or not, and whether it has revealed the reasons for achieving or failing them.

Sustainability accounting systems thus support sustainability strategies, where they provide appropriate, reliable and real information on the sustainability results of the company. Apart from supporting managerial decision-making, the information provided by sustainability accounting systems can also be utilized in other areas that give a basis for reports on sustainability. The major corporate benefits as well as micro- and macro-environmental benefits resulting from operating a sustainability accounting system are summarized in Table 3 as important contributing factors to the development and implementation of sustainability strategies.

TABLE 3 THE BENEFITS OF OPERATING SUSTAINABILITY ACCOUNTING SYSTEMS

Corporate benefits	**Micro- and macro-environmental benefits**
– Present the impact of sustainability performance on balance sheet earnings – Map cost-saving opportunities, revenues and financial advantages originating from sustainability -oriented operation – Evaluate, handle and reduce social and environmental risks, liabilities, cost and expenses – Create more favourable conditions in the course of economic or investment negotiations, and widen the range of potential investors – Help to determine the cost of production as well as to set the price of a product more accurately – Support establishing cleaner production projects, the evaluation of investments (by mapping the social and environmental effects of investment decisions) – Facilitate the appearance on the list of 'eco' suppliers – Facilitate tracing energy and material flows more accurately, and contribute to increased resource efficiency – Help the management make responsible decisions – Foster the social and environmental awareness of employees while performing their tasks and strengthen their commitment and motivation	– Satisfy the information needs of external users – Contribute to better relationships with the stakeholders – Ensure and improve the legitimacy, credibility and the reputation of the company – Increase the public recognition on the corporate accountability, transparency and trustworthiness in social and environmental issues, and thus improve the company's general acceptance – Facilitate the comparability of the company's sustainability performance to other companies or industrial sectors – Promote the application and improvement of sustainability accounting by acquiring knowledge on the best practices – Contribute to sustainable development on a corporate, national and global level

V. THE OVERVIEW OF THE OPERATION OF A SUSTAINABILITY STRATEGIC MANAGEMENT AND A SUSTAINABILITY ACCOUNTING SYSTEM

The following case study illustrates how a sustainability accounting system can be used to promote the successful implementation of a sustainability strategy in one of Hungary's largest chemical companies.

A. Background Information on TVK

The *Tiszai Vegyi Kombinát Public Limited Company* has 1097 employees till now and its annual sales revenue is about 374584 million HUF. It is a production company which produces ethylene and propylene with small-, medium- and high-density by processing naphtha and gasoline as raw materials with the help of the state-of-the-art technologies. It supplies raw materials to plastic manufacturing companies at home and abroad throughout Central, Eastern and Western Europe. The plastic products made from the raw materials supplied by TVK are essential for both industrial users and the broader public.

Along with *Slovnaft Petrochemicals, s.r.o.*, located in Bratislava, TVK is establishing the Petrochemical Division within the MOL Group, which holds a leading position in petrochemical sector in Central-Eastern Europe and – in terms of its production capacities – and is one of the ten largest polymer producers in Europe.

B. The Company's Current Strategic Position

The business community plays a crucial role in supporting the realization of sustainability. Growing evidence shows that responsible behavior of companies in the field of social issues and the environment contributes to the long-term business success. Recognizing this, the fundamental goal of TVK is to introduce a new system approach.

Sustainable development is an integrated part of the company's strategy as well as its daily operation. Consequently, there is no separately handled sustainability strategy or sustainable budget strategy, instead, each and every program is based on concept of sustainable development.

According to this, the company has determined the following six areas of concern within the three dimensions of sustainability for the coming period between 2012 and 2015: economic sustainability, health and safety, communities, human resources, environment and climate change.

TVK pays special attention to creating a cleaner, better environment, safe and healthy working conditions, for which it regards prevention and responsible care as a basic condition. Thus, the basic principles of sustainability and environment-centred thinking are deeplyrooted in the company's long-term strategy.

The company's sustainability strategic objectives, the integration of their elements into the overall corporate strategy and the major *causal relationships* between them are shown by the strategy map in Figure 6.

C. The Structure of TVK's Sustainability Accounting System

The company is aware that nowadays the benchmarks of long-term success and social acceptance cannot be observed only in economic indicators. Its activity is increasingly evaluated in the light of the company's ability to reduce the negative effects on both the environment and society. This goal is served by the development and operation of a sustainability accounting system.

1) The aim of TVK's sustainability accounting system:

TVK's sustainability accounting system contributes to the long-term realization of corporate sustainability by providing a well-established and applicable *planning and decision-making process* as well as ensuring an *effective controlling system*.

On this basis, the operation of the system is annually reviewed by using such benchmark documents as the Dow Jones Sustainability Index and the expectations of the international conventions for the purpose of complying with industry best practices, furthermore, existing and missing elements are continuously identified in order to see "what progress the company has made".

Its sustainability accounting system evaluates the efficient implementation of the formulated sustainability strategy together with achieving the designated objectives, furthermore, it encourages continuous improvement efforts, and helps to increase the level of *awareness* and *transparency*.

2) The principles and requirements of operating TVK's sustainability accounting system:

Every industrial sector and every corporation have different objectives and, therefore TVK is not exceptional in individually identifying and defining its objectives and tasks in terms of sustainability, which reads as follows: *"Sustainable development is a corporate commitment for us that is aimed at equally integrating economic, environmental and social factors into our daily business operations, maximizing long-term value and keeping the license we received from society to carry on our operations."*

As a chemical company, it has a significant impact on the environment and society; the negative consequences of its operations are reduced by applying the principles of *precaution* and *responsible care*.

The company marks the *boundaries* of its sustainability accounting system following the guidelines made by the UN's Global Compact and the GRI. In practice, it means that the company defines its strategic and operational objectives within the three dimensions of sustainability, and evaluates its sustainability performance.**Corporate mission**

Supplying its customers with high-quality olefin and polymer products, providing excellent services through continuous developments. Increasing the company's competitiveness, reducing risks, improving its social acceptance and the recognition of its usefulness. Taking serious environmental and social responsibility in the field of environmental protection, health and safety, education and culture.

Core values

Highly qualified, creative and motivated employees

Quality awareness and innovative approach pervading the company's operation

Responsibility-focused commitment to safety, health and the natural environment

Lasting business relations built on mutual benefits

Vision

Maintaining TVK's regional leadership in the petrochemical business by improving efficiencies, competitiveness and profitability continuously, by exploiting the growth of regional polymer consumption and by developing a mutually beneficial partnership and by optimising and diversifying its portfolio of products.

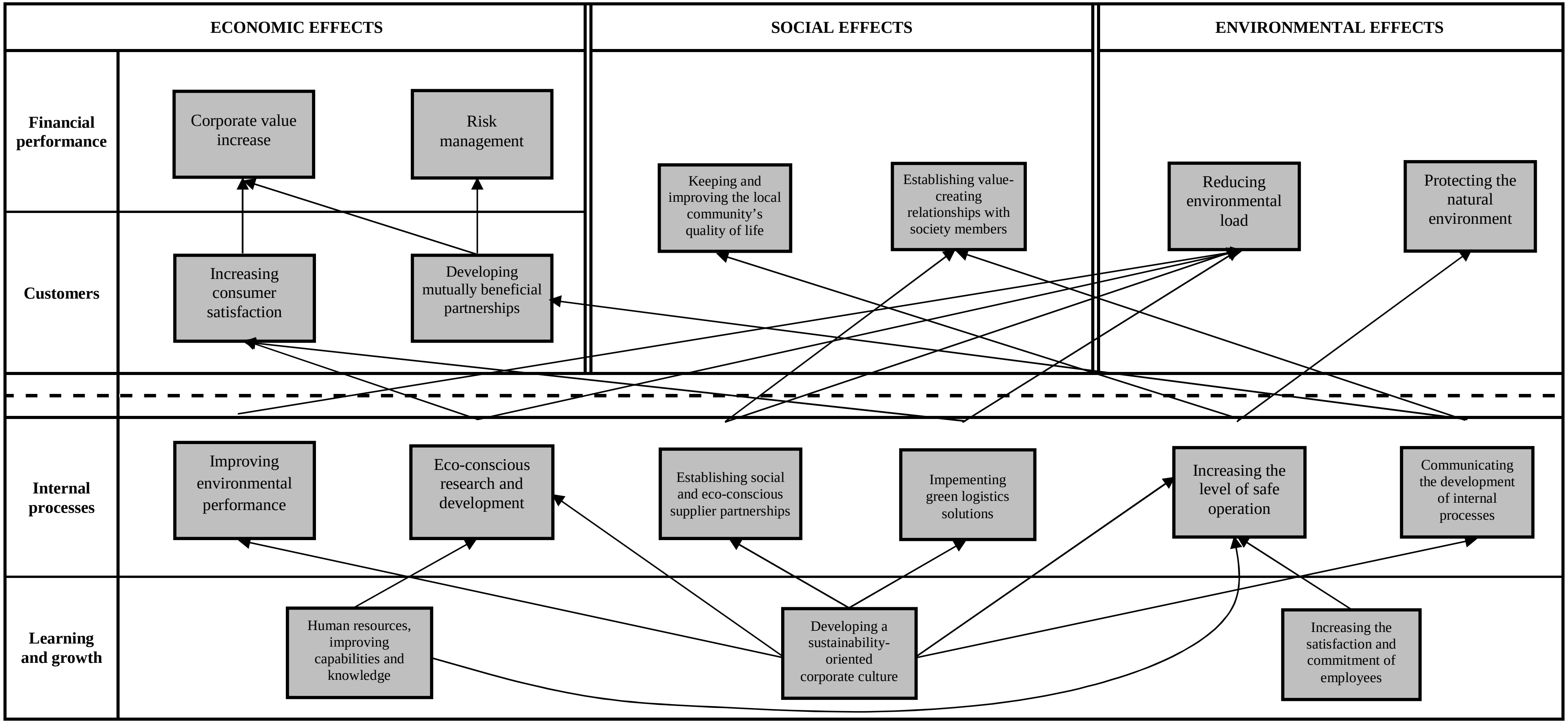

Fig. 6 Tisza Chemical Group Public Limited Company' s map of sustainability strategy [40]

The economic aspects primarily mean value creation, but the increase of customer satisfaction, the development of the local economy and infrastructure as well as reducing the possibility of corruption also appear. The social dimension is filled with the involvement of stakeholders, the organization of social investment programs, the improvement of employability, the development of human capital, ensuring the society's health and safety conditions and raising the customers' environmental consciousness. The environmental aspects extend to energy use, water consumption, reduced pollution, waste management, the moderate use of hazardous materials, the use of recycled materials, the protection and rehabilitation of the land and the conservation of biological diversity.

The *evaluation period* of the company's sustainability performance is basically determined on a yearly basis. During product development, however, the "cradle to grave" concept also appears, that is, the health and environmental effects on these products are taken into account through the whole product life cycle.

The currency unit employed by TVK, according to its size and international influence, is expressed in million HUF or in a thousand Euros. In addition, metric tons are commonly used as a natural unit of measure, partly for measuring the weight of the produced goods and partly for measuring environmental impacts.

3) Methods and devices for data collection, data record, measurement and analysis:

The nature of information its sustainability accounting system is required to collect is derived from TVK's sustainability strategy and its objectives. In most cases, the indicators are based on measurement and calculations but sometimes they are also based on estimations depending on the subject or on the premises.

The operational environment and the company's performance are constantly analyzed and evaluated in order to fully meet the shareholders' expectations.

Economic performance is evaluated by the quantification of environmental and social costs and revenues, the application of risk matrices, life-cycle analyses and benchmarks. The impact on society is examined with the help of stakeholder analyses and social efficiency indicators. The company's environmental performance is monitored by applying condition test methods, eco-efficiency indicators, and input-output analyses. Since TVK pays special attention to developments contributing to sustainability, it measures the percentage of the realization of such investments together with their average level of preparedness.

For the integrated evaluation of corporate sustainability performance, the Sustainability Balanced Scorecard is used. Apart from this, the company examines its compliance with the requirements of the GRI, its position in the ranking of sustainability and CSR, and it also appears in the definition of the Dow Jones Sustainability Index and the Oekom Research index.

One document of the sustainability accounting system is the corporate balance sheet on the resources, assets and liabilities of TVK in 2012, with emphasis on those lines that are associated with environmental protection and sustainability. These are included in Table 4.

TABLE 4 THE BALANCE SHEET OF TISZA CHEMICAL GROUP PUBLIC LIMITED COMPANY (MILLION HUF) [44]

Assets		**2012**	**Resources**		**2012**
A.	**INVESTED ASSETS**	**111.324**	**D.**	**TOTAL EQUITY**	**123.424**
I.	INTANGIBLE ASSETS	2.240	I.	SUBSCRIBED CAPITAL	24.534
II.	NON-CURRENT ASSETS	106.048	II.	SUBSCRIBED CAPITAL UNPAID	0
	Assets with environmental purposes:	*1.028*	III.	CAPITAL RESERVE	4.624
	Land and buildings	*268*	IV.	ACCUMULATED PROFIT RESERVE	103.585
	Plant and machinery	*234*	V.	TIED-UP RESERVE	0
	Other machinery	*92*	VI.	REVALUATION RESERVE	0
	Investments	*434*	VII.	PROFIT OR LOSS FOR THE YEAR	-9.319
III.	INVESTED FINANCIAL ASSETS	3.036	**E.**	**PROVISION**	**4.960**
B.	**CURRENT ASSETS**	**85.071**		*Provision for environmental liabilities*	*2.314*
I.	RESERVES	15.637		*Provision for CO_2 emission quota payments*	*2.179*
	CO_2 emission quota	*1.238*	**F.**	**LIABILITIES**	**65.276**
II.	ACCOUNTS RECEIVABLE	65.587	I.	SUBORDINATED LIABILITIES	0
III.	SECURITIES	0	II.	LONG-TERM LIABILITIES	5.518
IV.	FINANCIAL ASSETS	3.847	III.	SHORT-TERM LIABILITIES	59.758
C.	**ACCRUED ASSETS**	**352**		*Loans granted by MOL for securing CO_2 emission quotas*	2.996
			G.	**ACCRUED LIABILITIES**	**3.087**
				Performance incentive payments	*398*
				CO_2 emission quotas received free of charge	*221*
TOTAL ASSETS		**196.747**	**TOTAL EQUITY AND LIABILITIES**		**196.747**

The company's *assets with environmental purposes* mount up to only 1% of its total fixed assets. The opening value, the change in volume, the closing value and the depreciation of these assets have to be presented in the appendix of the balance sheet under the Act on Accounting. Among the reserves, the company's CO_2 emission quota can be found, which is received from the Hungarian state free of charge. The reserves for such environmental liabilities as the ongoing landscape rehabilitation, soil and groundwater remediation, monitoring, follow-up tasks after remediation are presented as provisions in the balance sheet. The company accumulates an additional provision, as the amount of CO_2 emission quota owned at the end of the year does not cover the amount of CO_2 actually emitted by TVK. For purchasing these quotas, it receives loans from the parent company, MOL.

In TVK's consolidated income statement, the items related to environmental protection and social activities are highlighted at the level of the operating profit or loss, which is illustrated in Table 5. Comparing the revenues, costs and expenses resulting from the company's sustainability operation, it becomes possible to ascertain its sustainability achievements. However, this can be misleading because the income statement can not display such elements as cost savings resulting from the application of environment-friendly technologies, and the increase in sales as a result of the "green image". Cost savings are difficult to quantify due to the complexity of the data.

TABLE 5 THE CONSOLIDATED INCOME STATEMENT OF TISZA CHEMICAL GROUP PUBLIC LIMITED COMPANY(MILLION HUF) [44]

Number of items	**Item**	**2012**
I.	**Net sales (revenue)**	416.308
	CO2 emission quota sales	*681*
II.	**Own performance capitalized**	4.146
III.	**Other income**	3.340
	Provision secured for CO_2 emission quotas	*2130*
	Provision secured for environmental protection	*92*
IV.	**Material costs**	405.320
	Environmental protection costs	*107*
	Waste disposal, recycling costs	*135*
	COGS-CO_2 emission quotas	*681*
	Training costs	*66*
	Health care costs	*46*
V.	**Staff costs**	8.605
VI.	**Depreciation**	11.452
	Depreciation of tangible assets with environmental purposes	*91*
VII.	**Other expenses**	14.470
	Expenses related to CO_2 emission quotas (impairment)	*1.540*
	Providing GHG emission units	*4.560*
	Provision secured for environmental protection	*376*
	Grants and benefits	*66*
A.	**Operating profit or loss for the year (I±II+III-IV-V-VI-VII)**	-16.053

4) TVK's sustainability accounts and reports:

From the above, it is obvious that TVK is committed to sustainable development and communicates its achievements with the stakeholders. An annual report is issued on the company's sustainability performance. Although monthly and quarterly reports are issued to the board of directors, they usually focus on the financial situation of the company, lacking any social and environmental information. The evaluation of sustainability investments and projects is an exception, provided that they report whether their realization is carried out in due time, in the required quality and below the originally approved budget.

The company developed a standard form for its reports, ensuring the comparability of its accounts. In terms of economic and financial issues, detailed information can be found in the *Annual Report*, while more can be read about the company's sustainability performance in its *Report on Sustainable Development*. It has to be noted that the company's Annual Report also includes data reflecting its sustainable performance in an integrated way.

5) The qualitative characteristics of information on sustainability:

By providing as much detailed and accurate industry-specific information as possible, TVK aspires to the greatest level of transparency in order to minimize the risks related to the anticipated economic, social and environmental changes and developments, and to ensure the comparability of the results. Therefore, the accounting information on its sustainability performance have to be *relevant, complete, comparable, accurate, timely, clear and reliable* and they equally have to be concerned with both the positive and negative effects (a *balance* should be sought after), they have to be in line with the stakeholders' expectations, and they have to present sustainability connections as well. As a summary of the above, the logical model of TVK's sustainability accounting system is shown in Figure 7.

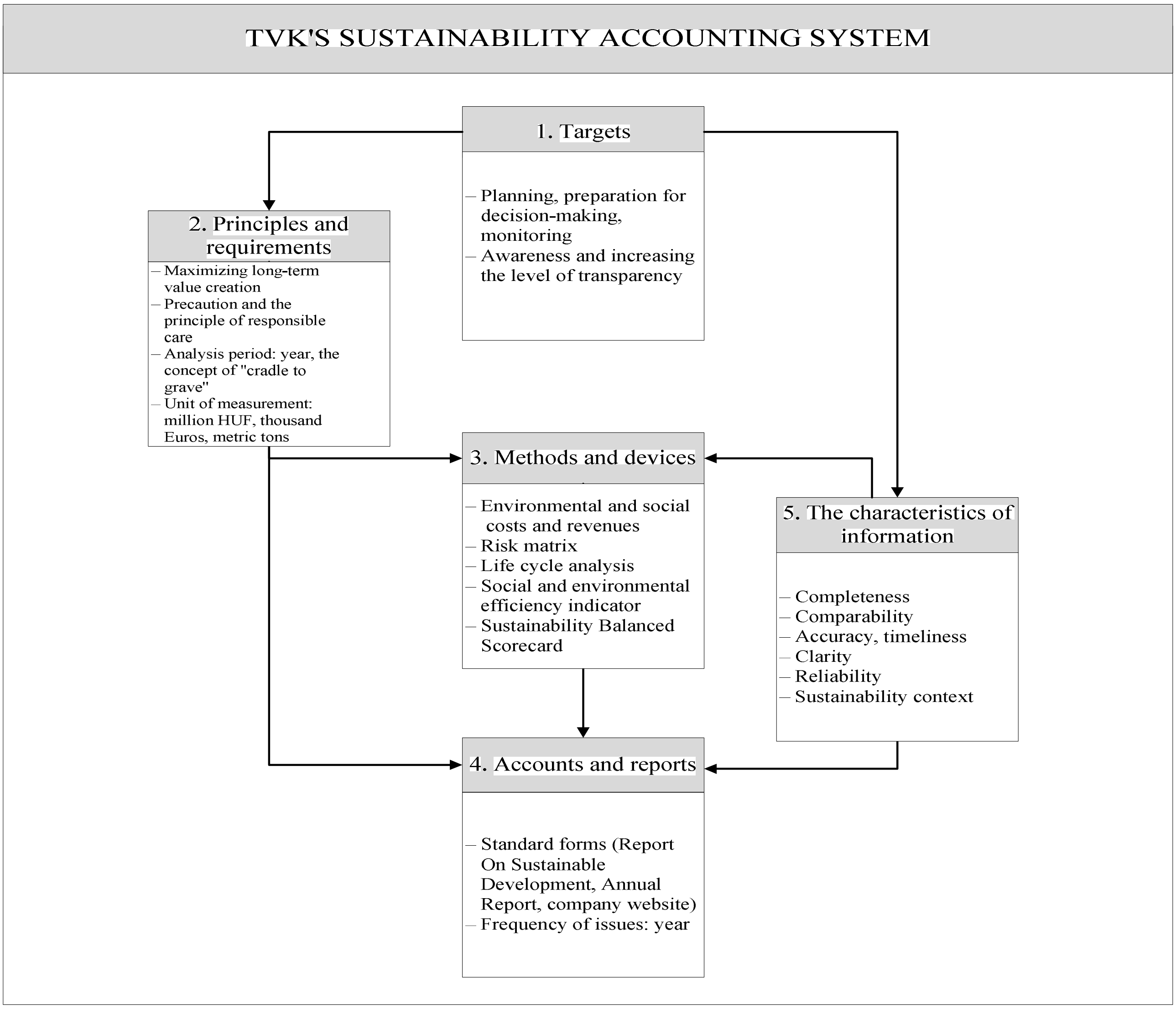

Figure 7 The logical framework of TVK's sustainability accounting system [45]

D. The result of TVK's Sustainability Strategy and its Accounting Experience

In order to maintain and reinforce TVK's regional petrochemical leadership, it is not enough for the company to implement sustainable development investments and develop a good relationship with the society, but it also has to quantify and evaluate its sustainability performance – as it is concluded in TVK's Report On Sustainable Development [44].

It is essential for the management of the company to receive an accurate picture on the realization of its strategic sustainability objectives, the financial aspects of the company's sustainable operation, and the environmental and social effects of TVK's activities and products.

As it was shown in its sustainability report in 2012, the most effective results were achieved in relation to climate change and the environment, while the company was the least effective in the course of implementing strategic objectives regarding economic sustainability. The evaluation of TVK's strategic goals set for 2012 is shown in Table 6.

With TVK's increased activities and environmental awareness in relation to sustainability, the role of sustainability accounting information has become more appreciated, which is predominantly provided by the corporate sustainability accounting system. The company's accounting system establishes a connection between social and environmental issues and financial opportunities, furthermore, it controls, maintains and enhances the company's economic, social and environmental capital, which may result in a significant competitive advantage. This is how the application of TVK's accounting system contributes to the company's sustainable operation and the successful implementation of its sustainability strategy.

TABLE 6 THE EVALUATION OF TVK'S STRATEGIC GOALS SET FOR 2012 [44]

Strategic goals set for 2012	**Evaluation**
Climate change "Improving energy efficiency and decreasing specific CO_2 emission by implementing major technological developments and optimising existing ES&DS and production assets both on the side of supply and demand keeping specific emission 1.06 t CO_2/t HVC .".	The specific CO_2 emission was 1,027.
Environmental protection "By utilising the opportunities of integrated water supply, we will minimize fresh water consumption at 3.9 million m^3 in 2012."	There was 3.7 m^3 fresh water consumption.
Labour protection and fire protection "The ratio of traffic accidents (RAR) has to be kept under 1.77."	RAR: 2,76
Communities "Make the operations of the chemical industry and the activity of TVK better known."	Our Company spent nearly HUF 50 million for sponsorship and donations in 2012.
Human capital "We have maintained our strategic goal of ensuring the availability of highly trained staff. Accordingly, our employees participate in professional trainings and competence building courses."	We spent HUF 75 million in 2012 on training and education courses.
Economic sustainability "By cost-effectively executing the tasks determined in the Technical Intervention Plan, the amount of known environmental liabilities of TVK Plc. using risk based approach decreases by 5.8%."	Provision secured for environmental purposes rose by 14%.

VI. CONCLUSIONS AND CONTRIBUTIONS TO THE DISCIPLINE OF SUSTAINABILITY MANAGEMENT

The novelty of the present paper can be evaluated and summarized in three ways.

1. We improved the general process of strategic management in accordance with the sustainability principles from the creation of a sustainability strategy, through its implementation to the performance evaluation. We identified the modern management methods adequate to the tasks and activities of the individual process stages and described their selection criteria.
2. We reviewed the development stages of accounting in the last two decades from the aspect of the extent to which the principles of sustainability – traditional accounting (economic aspects), environmental accounting (economic and environmental aspects) and sustainability accounting (economic, environmental and social aspects) are integrated. We compared the characteristics of individual accounting information systems with the aim to make the selection of methods and tools used in the strategic performance evaluation process easier.
3. We demonstrated the practical application of the conceptual model of a sustainability accounting system in a company case study. We determined the connection between sustainability strategies and sustainability accounting, and outlined the company and environmental benefits of applying this system.

These results, of course, can be regarded as the initial steps of a new research project that needs further specification on both theoretical and practical perspective in the near future.

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