

**Andrzej Chodyński, Wojciech Huszlak**

**The Balanced Scorecard in achieving  
proecological business model**  
(Wykorzystanie strategicznej karty wyników  
w realizacji proekologicznego modelu biznesu)

**Introduction**

New possibilities regarding conducting business activities, related to the advent of new information and telecommunication technologies, changes in the surrounding political, social, and legal reality, as well as implementation of innovative ways leading to the achievement of goals have contributed to the growing popularity of business models in recent years. One of the possible business models, based on identified key success factors, are the strategic maps (Norton, Kaplan)<sup>1</sup>. However, they require individual adaptation to each organization.<sup>2</sup> According to B. Rogoda the following are the components of the business model: product, position in the value chain, revenue generation, price structure, acquisition of order, and distribution<sup>3</sup>.

A business model can be represented as the Balanced Scorecard (BSC) and in the case of a business model including ecological aspects as the Sustainability Balanced Scorecard (SBSC).<sup>4</sup> R.S. Kaplan and D.P. Norton suggest to transform

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<sup>1</sup> K. Janasz, W. Janasz, K. Koziol, K. Szopik-Depczyńska, *Zarządzanie strategiczne. Koncepcje – Metody – Strategie*, Difin, Warszawa 2010, p. 80.

<sup>2</sup> M. Jabłoński, *Zarządzanie wartością przedsiębiorstw o orientacji jakościowej a kapitał intelektualny*, Oficyna Wydawnicza "Humanitas", Sosnowiec 2009, p. 17.

<sup>3</sup> B. Rogoda, *Metoda klasyfikacji modeli biznesu w oparciu o czynniki konstytuujące model*, [in:] *Współczesne zagadnienia zarządzania. Przedsiębiorstwo – biznes – region*, red. A. Chodyński, Oficyna Wydawnicza AFM, Krakowska Akademia im. Andrzeja Frycza Modrzewskiego, Kraków 2009.

<sup>4</sup> A. Chodyński, *Wiedza i kompetencje ekologiczne w strategiach rozwoju przedsiębiorstw*, Difin, Warszawa 2007, p. 185.

missions and strategies to goals and measures in four perspectives using Balanced Scorecards. They are not concerned with the manner of strategy formulation but suggest transforming strategy to operational activities. Strategies are transformed into activities through strategy maps and the Balanced Scorecard. The Balanced Scorecard may be used to elaborate visions and strategies, interpret goals and strategic measures and integrate them with the system of management, planning, goal setting, and undertaking strategic initiatives as well as to improve the systems of monitoring strategy achievement combined with learning the organization<sup>5</sup>. The Balanced Scorecard has evolved over years. Its primary aim was to measure the performance of the company in four perspectives (financial, customer, internal business processes, and learning and growth). Then BSC was perceived as a complex management system in strategic and operational approach. Supplementing BSC with strategy maps rendered it possible to describe the strategy in a visual way and show cause-effect relationships between its constituents. A strategy map is the starting point for creating the BSC, a system which enables description, implementation, monitoring, and execution of a strategy.

Further improvement of BSC was connected with emphasizing organizational synergy and using, in a strategic aspect, intangible assets.<sup>6</sup>

Balanced Scorecard is executed as part of a strategic plan. According to Kaplan and Norton, the elaboration of a strategic plan includes mission formulation, defining the system of values, outlining visions and strategic goals, defining a strategy, preparing a strategy map, working out BSC, setting strategy initiatives, and defining operational activities<sup>7</sup>. The mission may include social and ecological aspects and may influence the company's ethical principles. The mission should constitute a foundation on which the company's system of values and future relations with stakeholders will be based.

### Proecological business model

Business models of contemporary enterprises are to ensure flexible adjustment to the changing environment. However, the character of the environment can change in various ways. Therefore a model which allows to start these of its elements which are useful in a given situation would be an ideal solution. Contemporary approach to business models indicates that such a business model (defined as

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<sup>5</sup> R.S. Kaplan, D.P. Norton, *The balanced scorecard. Translating strategy into action*, Harvard Business School Press, Boston, Mass. 1996.

<sup>6</sup> J. Świerk, *Mapa strategii i strategiczna karta wyników w planowaniu działań przedsiębiorstwa*, Wyd. UMCS, Lublin 2009, p. 54–55.

<sup>7</sup> R.S. Kaplan, D.P. Norton, *Strategy maps: Converting intangible assets into tangible outcomes*, Harvard Business School Press, Boston, Mass. 2004, p. 32.

sustainable enterprise) can include, depending on the situation, eleven elements: trust management, change management, leadership, innovation management, knowledge management, virtualization, corporate governance, organizational culture management, entrepreneurship management and ecology.<sup>8</sup> The authors of this approach emphasize that all elements considered and implemented separately will not ensure the achieving of business sustainability. They suggest holistic approach to sustainable enterprises, which consists of two groups of elements: mandatory (permanent attention on highest level and readiness to implement immediate changes, i.e. the ability of renewing the enterprise) and facultative ones, i.e. elements which may appear in a certain configuration, depending on the environment where the enterprise is functioning, including ecology. Therefore the concept of sustainable enterprise depends primarily on:

- location of the enterprise,
- industry,
- knowledge and competence of employees,
- stability of economic, political, and social system,
- features of national character.

Proecological attitude of the enterprise may decide on its success on local and international markets. The significance of nature was confirmed by the studies of F. Trompenaars and C. Hampde-Turner who demonstrated that ecology is one of priority factors, decisive for achieving long-lasting competitive superiority on the market.<sup>9</sup>

Taking into consideration the ecological factor on all levels of the organization with regard to the needs of all stakeholders in the process of accomplishing main values of the organization decides on its ecological responsibility. Assumptions of ecological responsibility may constitute a platform for creating and using a social organization model based on the principles of corporate social responsibility (CSR) with emphasis on ecological factor as the foundation for building corporate value named ECSR (Environmental Corporate Social Responsibility model).<sup>10</sup>

Ecological criteria, as value drivers, are an element linking internal and external factors in order to elaborate an effective business model. Ecological criteria, in particular:

- are the foundations for the growth of the enterprise,
- are a source of competitive supremacy,
- are a platform for the realization of the company growth strategy,
- are the basis for building the company's value,

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<sup>8</sup> W. Grudzewski, I.K. Hejduk, A. Sankowska, M. Wańtuchowicz, *Sustainability w biznesie, czyli przedsiębiorstwo przyszłości. Zmiany paradygmatów i koncepcji zarządzania*, Poltext, Warszawa 2010, p. 319–325.

<sup>9</sup> *Ibidem*, p. 260.

<sup>10</sup> A. Chodyński, A. Jabłoński, M. Jabłoński, *Environmental Corporate Social Responsibility (ECSR) – koncepcja strategiczna budowy wartości firmy oparta na kryteriach ekologicznych*, „Przegląd Organizacji” 2008, 3, p. 31.

- are the basis of a social dialogue,
- constitute a balance point between shareholders and other stakeholders,
- are a comparative criterion in the process of assessing competitiveness of the enterprise.<sup>11</sup>

When creating a business model, specificity of activity sectors, also in respect to ecological aspects, needs to be taken into account. This concerns in particular sectors which may be hazardous to the environment, with consideration of regional aspects. In the construction of business models, it is also crucial to take into account the ecological competencies of a businesses.<sup>12</sup>

Works of S.M. Shafer, H.J. Smith, and J.C. Linder support the proecological business model. The model considers 20 components that make up four key categories: strategic choices, value networks, creating value and gaining value<sup>13</sup>. Such a model may take into consideration:

- choices based on strategic ecological competences construed using knowledge management, learning, and intellectual capital;
- within the chain of values – creating links within the ecology of industry (in the sector of activities; product making chain, and regional groups), chains of companies, and intelligent public administration with participation of proecological non-profit organizations;
- within the frames of value creation – using available inputs and effectiveness of processes along the chain of values, taking into consideration ecological requirements;
- within the scope of achieving values – being distinguished with innovativeness and ecological quality, based on ecological awareness of society and all stakeholders.<sup>14</sup>

### **The Balanced Scorecard as a projection of the proecological business model**

The concept of Balanced Scorecard originated in the early 1990s as a reaction to many problems hindering efficient functioning and achieving long-term strategic success, including:

- excessive focusing on short-term improvements rather than the ones conditioning long-term growth,

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<sup>11</sup> *Ibidem*.

<sup>12</sup> A. Chodyński, *Wiedza i kompetencje...*, p. 190–191.

<sup>13</sup> S.M. Shafer, H.I. Smith, I.C. Lander, *The power of business models*, “Business Horizons” 2005, vol. 48, p. 202.

<sup>14</sup> A. Chodyński, *Przedsiębiorczość ekologiczna a rozwój przedsiębiorstwa*, “Przegląd Organizacji” 2009, 2, p. 34.

- lack of effective way of strategy implementation,
- lack of information indicating which key effectiveness indicators are important for the effectiveness of the whole enterprise.<sup>15</sup>

The concept of BSC is based on the assumption that effective use of investment capital is no longer the only indicator of competitiveness supremacy, as growing significance is being attributed to the so-called soft factors, such as intellectual capital, knowledge creation, or orientation at a customer.<sup>16</sup>

The concept suggested by R.S. Kaplan and D.P. Norton links in a balanced way long and short-term goals, financial and non-financial measures, indicators of operational activities output, leading indicators, as well as internal and external effectiveness.<sup>17</sup>

Taking into consideration elements of performance measurement of current goals of the enterprise enables to assess short-term effectiveness improvement and, due to the analysis of future indicators, to determine whether a given strategy has been implemented correctly and ensures long-term success of the enterprise. In this strategy strategic goals of the organization should not contradict one another but rather equalize in four perspectives to increase the value for stakeholders. The structure of BSC is based on cause-effect dependences between goals and activities included in the four related perspectives: financial, customer, internal business processes and learning and growth.<sup>18</sup> The starting point for constructing the BSC is to develop employee competencies implemented in the perspective of knowledge (learning) and development, which should serve to implement efficient processes (process perspective). Effective processes should ensure loyal customers (customer perspective). Implementation of those successive actions should lead to achieving the desired financial outcomes (financial perspective). All perspectives are created in the same manner, i.e. for any and each of them are defined strategic goals, goal performance indicators, detailed goals (goal values), strategic initiatives and operational activities.

The first perspective (financial) is to measure whether strategy implementation and achievement contribute to the improvement of economic results and satisfaction of all the owners of the company's assets. The degree of satisfaction is determined by the profitability of invested capital, which can be measured by measures such as operating profit and return on capital or modern measures, such

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<sup>15</sup> K. McNaulty, *Od strategii do działania*, [in:] J. Świerk, *op. cit.*, p. 52.

<sup>16</sup> F. Figge, T. Hahn, S. Schaltegger, M. Wagner, *The sustainability Balanced Scorecard – linking sustainability management to business strategy*, "Business Strategy and the Environment" 2002, vol. 11, p. 269–284.

<sup>17</sup> A. Chodyński, A.S. Jabłoński, M.M. Jabłoński, *Strategiczna Karta Wyników (Balanced Scorecard) w implementacji założeń rozwoju organizacji*, Krakowska Szkoła Wyższa im. Andrzeja Frycza Modrzewskiego, Kraków 2007, p. 21.

<sup>18</sup> R.S. Kaplan, D.P. Norton, *Strategiczna karta wyników. Jak przełożyć strategię na działania*, Wyd. Nauk. PWN, Warszawa 2001, p. 12.

as economic value added (EVA) and CFROI. The objectives formulated in this perspective are a point of reference for the establishment of objectives and indicators within subsequent perspectives.

The second perspective (customer) defines a client or groups of clients, their needs, segments of the market in which the company will be competing as well as performance indicators related to them. The objectives of this perspective should take into account the preferences of (groups of) customers which determine their purchasing decisions, including pro-ecological preferences, allowing to achieve a position that enables creation of an offer distinct from the competition. This perspective includes several basic indicators such as customer satisfaction, customer retention, acquisition and profitability, and the quantitative and qualitative share in the target market. It should also contain customer segment-specific factors affecting the implementation of strategic objectives (future success factors), such as short lead times, timely deliveries, and ability to adapt to the needs of the recipient.

Defining financial goals and customers necessary to achieve these goals creates a space for defining and elaborating key internal processes in the company's activities. The processes are to enable the creation of values which will draw and hold clients and lead to satisfaction of shareholders in respect to their financial goals. Norton and Kaplan distinguish four groups of processes: operational management, client management, innovative, regulatory, and social. These processes constitute the third perspective – internal business processes. This perspective includes activities aimed at the greening of business processes.

The fourth perspective (learning and growth) shows intangible assets necessary to achieve goals set in the first three perspectives. According to Kaplan and Norton these are three categories of intangible input: human capital (skills, talent, and know-how of employees), information (systems, data bases, technologies), organizational (organizational culture, leadership, adjustability of employees and the ability to share knowledge with others).

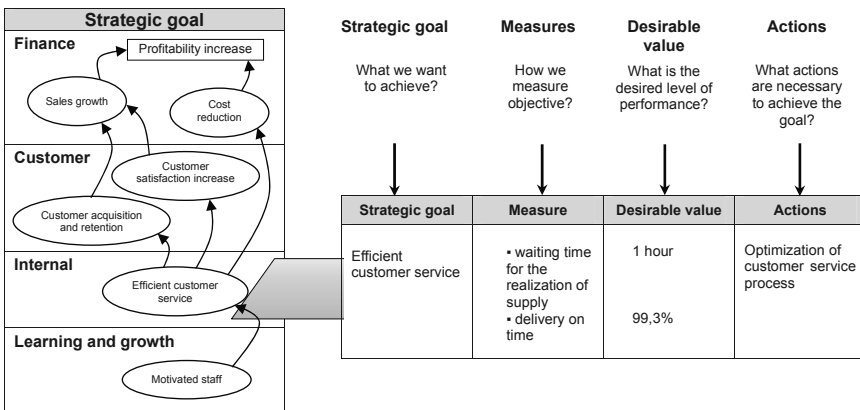
The Balanced Scorecard concept evolved into a strategy map which is the starting point for elaboration of a balanced scorecard. It is a visualization of cause-effect relationships between its various components and allows to determine whether there exist links between the goals set for each perspective. Therefore it shows how the organization is going to use its infrastructure and translate intangible inputs to desired financial outputs. Thus, it clearly shows how the implementation of one objective (cause) affects the achievement of another goal (effect). Therefore, the strategy map can be defined as a set of hypotheses about:

- the impact of objectives from the perspective of knowledge and development on the goals from the process perspective,
- the impact of the objectives from the perspective of processes on the goals from customers perspective which define the value proposition for the customer,

- the impact of the objectives from the perspective of the customer defining the assumed value proposition for the customer on performance goals resulting from the customer's perspective,
- the impact of performance objectives from the perspective of customers on the objectives from the financial perspective.<sup>19</sup>

Therefore, it presents how the organization intends to use its infrastructures and transform its intangible assets into the desired financial results. It provides a static view of organizational strategy. Due to quantification of objectives, determining of the implementation time, and deployment of initiatives, the strategy map is a dynamic picture of the value creation process. Kaplan and Norton are of the opinion graphic visualization of a strategy is a very important tool in the BSC concept, which facilitates concentration of the value creating process.

Fig. 1. Strategy map



Source: own elaboration.

The system of strategic goals, created based on the strategy map and picturing connections and cause-effect relationships<sup>20</sup> should be supplemented with a set of measures for each of the BSC perspectives. Linking indicators to goals allows for expressing goals in value terms and measure progress in reaching towards them.

The structure of BSC allows for using a wide set of measures to measure a wide category of goals, such as financial and non-financial, long and short-term, quali-

<sup>19</sup> M. Pietrzak, *Opracowanie koncepcji biznesowej Balanced Scorecard – mapa strategii*, "Controlling i Rachunkowość Zarządzca" 2006, 2, p. 22.

<sup>20</sup> Assessment of links and relations of goals (importance and interrelation between them) can be held using Vester's method at identification of key strategic goals, M. Jabłoński, A. Jabłoński, *Jak zastosować metodę Vester'a przy identyfikacji kluczowych celów strategicznych*, "Controlling i Rachunkowość Zarządzca" 2005, 6.

tative and quantitative, external and internal. Two types of measures are used in the BSC – lagging indicators, also known as goal achievement indicators in each of the perspectives. They may be of primary importance on the achieved competition supremacy.<sup>21</sup> These include mostly financial measures and are related in whole to the past. The other group of measures are leading indicators which concern the future success and inform of possible changes prior to their occurrence. Among them are non-financial indicators.

The role of factors included in particular activity areas reflected in the BSC to a considerable extent depends on the requirements imposed by the enterprise's environment and adopted requirements. Ecology may serve as an example of such a factor. Its role is conditioned by conditions hazardous to natural environment but also the requirements imposed by particular stakeholders, including customers and local society or formal and legal requirements. Taking into account environmental factor in economic activity can be considered to varying degrees in different sectors (Table 1). In the emerging sectors (e.g. IT, consultancy services), ecology may be less exposed, unless it forms the basis for developing a new product (service). Underestimating or even omission of environmental factors in those sectors is due to the attractiveness of those sectors or the validity of other factors. Ecology is perceived differently in the declining sectors (e.g. mining, metallurgy, energy, chemicals). Those businesses, however, focus mainly on meeting the relevant environmental criteria due to the environmentally harmful nature of traditional activities and the implementation of a strategy aiming at making ecology the distinguishing feature in the niche market.<sup>22</sup>

Table 1. Place and role of ecology in emerging and declining SMEs and large sectors

Enterprise	Declining sector	Emerging sector
Small	Observance of environmental criteria Strategy aiming at making ecology the distinguishing feature in the niche market (product and process)	From the perspective of the strategic objectives, it is poorly exposed, unless it is the basis for a new product/service
Medium		
Large	Observance of environmental criteria	Viewed from the perspective of striving to meet regulatory

Source: A. Jabłoński, *op. cit.*, p. 80.

<sup>21</sup> A. Chodyński, A.S. Jabłoński, M.M. Jabłoński, *Strategiczna Karta Wyników...*, p. 19.

<sup>22</sup> A. Jabłoński, *Modele biznesu w sektorach pojawiających się i schyłkowych. Tworzenie przewagi konkurencyjnej przedsiębiorstwa opartej na jakości i kryteriach ekologicznych*, Wyd. WSB, Dąbrowa Górnicza 2008, p. 6–61, 241–245.



Thus, basing a business model on environmental criteria may depend, to a significant extent, on sector circumstances arising from the various stages of sector development. The criterion of business size is not without significance to the location of environmental objectives. Environmental objectives are clearly articulated by large companies, polluting the environment.<sup>23</sup>

Particular features of the Balanced Scorecard include:

- possibility of extending its areas, taking into consideration of goals set by various stakeholders of the organization, depending on its character (e.g. commercial and non-commercial organizations);
- degree of goal differentiation which may result from being orientated at satisfying the investors' wishes with wide consideration of the other stakeholders.<sup>24</sup>

### **Possibilities of including ecological and social aspects in the BSC**

A balanced scorecard may include social and environmental (ecological) aspects in several possible ways. The first way is to include such aspects in the already existing perspectives, the other one to include a new perspective covering social and ecological issues with the assumption that it have effect on the remaining four perspectives, and the third one is to create a completely new, separate BSC for ecological and social issues as continuation of the one in the first two possibilities.<sup>25</sup>

When constructing a BSC that takes into account the social and environmental aspects (SBSC), it should be assumed that:

- integration of business management with the management of environmental and social aspects occurs,
- the basis for developing a strategy that takes into account environmental and social factors should be the specific characteristics of a business,
- integration of social and environmental aspects for a Strategic Business Unit (SBU) should be preceded by an assessment of whether to introduce an additional non-marketing area to the SBSC.

In the recent dozen or so years enterprises representing various industries and sizes have experienced huge changes in the ways of competing. In order to cope with growing competitiveness they had to implement new, innovative manage-

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<sup>23</sup> *Ibidem*, p. 77.

<sup>24</sup> A. Chodyński, A.S. Jabłoński, M.M. Jabłoński, *Strategiczna Karta Wyników...*, p. 10.

<sup>25</sup> F. Figge, T. Hahn, S. Schaltegger, M. Wagner, *The Sustainability Balanced Scorecard – Theory and Application of a Tool for Value-Based Sustainability Management*, Center for Sustainability Management, University of Luenburg, Paper presented at the Greening of Industry Network Conference 2002, Gothenburg.

ment tools such as Total Quality Management (TQM), Just in Time (JIT), and Business Process Reengineering (BPR) just to be a step ahead of competitors. In recent years another approach has emerged, which marks strategic directions. This approach is “greening movement”, “proactive environmental strategies”, i.e. implementing at each activity level environment-friendly initiatives as the way of increasing competitiveness.<sup>26</sup>

The realization of such an approach may be based on measuring and monitoring system which is grounded on indicators related to initiatives considering ecological aspects. P. Rao *et al.* suggest an innovative way of using indicators for the purpose of measuring and monitoring on all business levels, namely the Environmental Indicator System (EIS)<sup>27</sup>, to help enterprises to assess their environmental performance combined with economic performance. In order to better understand environmental indicators it is worth analyzing other indicators systems, for example the ones established by European Environmental Agency (EEA), Bridges to Sustainability or International Standards Organization (ISO). Systems (frameworks, schemes) of measuring sustainable development in economic, social and environmental terms, including environmental indicators, should also be taken into consideration as a key component in addition to the indicators relating to social and economic aspects. An example of such a system may be the Global Reporting Initiative (GRI), which is based on the Sustainability Reporting Guidelines.

Such a system of measurement can be used in communication with external stakeholders, such as stock-exchanges, banks, and organizations acting on behalf of environment protection (e.g. Environmental Protection Agency)<sup>28</sup>. In other words, the use of indicators leads to Corporate Environmental Reporting (CER) or Sustainable Reporting<sup>29</sup>, within the frames of which enterprises prepare reports for a wide group of stakeholders.<sup>30</sup> Increasing interest in this type of communication is visible – each year there are more and more companies that publish reports. There are also an increasing the number of models and approaches to reporting.

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<sup>26</sup> *Ibidem.*

<sup>27</sup> P. Rao, A.K. Singh, O. la O'Castillo, P.S. Intal Jr., A. Sajid, *A metric for corporate environmental indicators... for small and medium enterprises in the Philippines*, “Business Strategy and the Environment” 2009, vol. 18, p. 14–31.

<sup>28</sup> S.A. Melnyk, D.M. Stewart, M. Swink, *Metrics and performance measurement in operations management: Dealing with metrics maze*, “Journal of Operations Management” 2004, vol. 22, p. 209–217.

<sup>29</sup> R.S. Marshall, D. Brown, *Corporate environmental reporting: What's in a metric?*, “Business Strategy and the Environment” 2003, vol. 12, p. 87–106.

<sup>30</sup> Looking at current discussions in different for a at the international level, a movement away from the use of „sustainability reporting” towards the more general concept of “environmental, social and governance” (ESG) disclosure has been observed, *Carrots and sticks – promoting transparency and sustainability*, Global Reporting Initiative, KPMG, United Nations Environment Programme, Unit for Corporate Governance in Africa, May 2010.

According to a survey conducted by the UNEP (United Nations Environmental Programme) and KPMG (2006–2010), 142 different standards, guidelines and regulations relating to sustainability-related reporting operated in 30 countries<sup>31</sup>.

### **Environmental Indicator System**

Environmental Indicator System was based on a framework prepared by Ministry of Environmental Protection in Bonn and Federal Agency of Environmental Protection in Berlin. Consistent with the system, environmental indicators can be divided into three different groups reflecting: the company's environmental impact – Environment Performance Indicators (EPI), management's environmental activities – Environment Management Indicators (EMI), and external condition of the environment – Environment Condition Indicators (ECI).

These indicators converge various types of data concerning the environment in the form of a set of key indicators which support the assessment of environmental performance. In practice they may serve as a tool to measure, compare, and monitor the influence of the company on the environment. These indicators can also be used as part of the **environmental management system** (EMS) in order to check whether the company has gained the set goals. They are also equally effective in companies which do not use the system.

The EMS system supports decision-making process in the company by a precise measurement of the amounts of used water and sewage, electricity, gas emission to air, etc. It helps to assess the actual impact on the environment and the activities which the management has decided to implement, including supporting financial and organizational activities which have been undertaken in order to improve the company's environmental impact. These indicators also measure the company's impact on the quality of water in nearby rivers and lakes, the quality of air, deforestation ratio, and ozone destruction level. EIS authors point out at a considerable linear correlation between EMI and EPI indicators, EPI indicators and the impact on the environment, business performance, and competitiveness. Their studies demonstrate that environment indicators (or EIS) lead from activities undertaken by management to competitiveness through the impact on the environment and business performance. A considerable correlation between environmental indicators (EI) and environmental performance (EP) was also noted, meaning they considerably reflect the effectiveness of the environmental impact. It is noticeable how the chain of latent constructs which starts at EMI and runs to EPI and then to environmental performance and business performance results in the improvement of competitiveness. The logics of this chain lies in the fact that every process which includes ecological aspects starts with the decision and involvement of the company's manage-

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<sup>31</sup> Australia, Austria, Belgium, Brazil, Canada, Chile, China, Denmark, Ecuador, Finland, France, Germany, Greece, Hungary, India, Indonesia, Italy, Japan, Luxembourg, Mexico, The Netherlands, Norway, Portugal, South Africa, Korea, Sweden, Switzerland, United Kingdom, United States.

ment. In effect investments of ecological nature are made, funds for staff training ensured, suppliers are encouraged to adopt the environmentally-friendly policy, and finally ecologically clean processes and adequate technologies are implemented. Management's decisions are reflected in EMI indicators and promote activities that aim at reducing waste, protection of natural materials in the production processes, reduction of the share of harmful materials both as input and waste, increase of the share of secondary materials and renewable energy, reduction of the use of water and energy, reduction of solid and liquid waste, reduction of gas emission to air, etc. All these activities constitute EPI indicators which, in turn, lead to gaining impact on environmental performance in areas such as reduction of waste, emission to air, etc. A smaller negative impact on the environment in turn favours business performance and higher competitiveness. Such a logical chain of activities could be true in any company. Summarizing, EMI lead directly to EPI, not only reducing a negative impact on the environment but also by improving competitiveness, the fact that should be convincing companies regardless of their size and encourage them to initiate ecologically-friendly activities.

### **European Environment Agency**

European Environment Agency (EEA) elaborated a three-level typology of indicators, based on the questions which are answered by indicators. The typology includes descriptive, efficiency, and performance indicators.<sup>32</sup>

Descriptive indicators answer the question: "What is going on in the environment?" They describe a current condition of the environment and everything that is important for the understanding thereof, providing vital data without interpreting them. Such data can be significant or insignificant, may reflect improvement or worsening, may be characteristic for a given location (branch) or the whole organization. They give an absolute measurement but to be of any use in the evaluation or decision-making process, they must be linked to other important information.

Effectiveness indicators provide information on how effectively the inputs of the environment are used in the production process of a social property. They constitute the data basis which serves to answer the question: "Do our actions lead to improvement?" Therefore information on the quantities of inputs used in production and the quantities of productive output manufactured of such inputs is included in these indicators.

Furthermore, such indicators provide comparative data for a given time period, which can be used to evaluate the changes. These measures unconditionally assume that human activity represented by productive output is a vital element in the interpretation of using environmental inputs. By comparing current con-

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<sup>32</sup> R.S. Marshall, D. Brown, *op. cit.*, p. 87–106.

dition with the desired one, preference indicators show whether the activities we have undertaken are of any meaning. The set goal may be either an ideal one (e.g. no waste) or a defined one (e.g. reduction of greenhouse gases to 90% of the level from the year 2000). Descriptive indicators show the impact on the environment just in a fraction, regardless of the actual environmental performance of the organization. Even if shown in a wider time span they do not give information on the effects. Effectiveness indicators provide data of both economic and environmental nature. They relate environmental inputs to economic outputs. Performance indicators give a complete review of the management and performance effectiveness in whole. They not only show the impact on the environment but also the effectiveness of the actions implemented by the organization. Therefore, for stakeholders they are a vital source of information on the company's achievement of the set targets and for the management on the necessity of additional inputs.

Performance indicators are evidently most useful for stakeholders from the perspective of a balanced growth due to the fact that they show which aspects require improvements. From this point of view these indicators can be deemed as the ones which forecast the final output and provide information on future decisions. Effectiveness indicators are second useful as they provide standardized outputs to evaluate progress and compare alternative methods and companies. Least useful of all are descriptive indicators due to the fact that they fail to give information that would enable the evaluation of the so-far (past) activity rather than future planning.

### **Bridges to Sustainability**

BRIDGES to Sustainability Institute, a non-profit organization, develops metrics that correlate environmental and economic performance in the production processes. This management strategy incorporates eco-efficiency, where controlling of the same metrics that lead to environmental performance also leads to more efficient production processes, and better quality of goods and services.

The indicators of sustainability, in this system called Bridges Sustainability Metrics, have five basic components (except pollutant effects):

- material intensity,
- energy intensity,
- water consumption,
- toxic emissions,
- solid wastes.<sup>33</sup>

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<sup>33</sup> B. Beloff, D. Tanzil, G. Ma, *Sustainability metrics. Innovating for Sustainability*, 11<sup>th</sup> International Conference of Greening of Industry Network, San Francisco, October 12–15, 2003, p. 6.

A seventh basic impact category, land use, is currently under development.

The above-listed eco-efficiency categories can be captured by a small number of metrics. The set of “basic metrics” adopted by BRIDGES to Sustainability shown in Table 2.

Table 2. BRIDGES’ Basic Sustainability Metrics

Output:  <i>Mass of Product or Sales Revenue or Value-Added</i>	Material Intensity:	Mass of raw materials – Mass of products ----- Output
	Water Intensity:	Volume of fresh water used ----- Output
	Energy Intensity:	Net energy used as primary fuel equivalent ----- Output
	Toxic Release:	Total mass of recognized toxics released ----- Output
	Solid Wastes:	Total mass of solid wastes ----- Output

Source: D. Tanzil, B. Beloff, *Assessing impacts: Overview on sustainability indicators and metrics*, “Environmental Quality Management” 2006, Summer, p. 48.

BRIDGES’ sustainability metrics are constructed as ratios with environmental impacts in the numerator and a physically – or financially – meaningful representation of output in the denominator. They follow a simple rule that the lower the metric the more effective the process. The metrics are usually calculated with mass of product(s), dollar sales revenue, and dollar value-added in the denominator. Other representations of outputs, however, can also be used. This includes other units of production (volume, pieces of products, etc.) and functional units such as service life. To protect proprietary information, the value-added is defined simply as the difference between sales revenue and the costs of raw materials and utilities. Where confidentiality is not concerned (such as for internal use), one may alternatively use profit margin in place of the value-added denominator.<sup>34</sup>

Within each of the above categories, sub-metrics or complimentary metrics can be developed to fulfill the needs of the different functions under the production area. The system discourages inclusion of too many components as they make the system less versatile and less useful to the manager. Once the metrics are evolved and measured, they can be used for benchmarking performance, tracking progress and evaluating processes. These metrics can be combined to calculate the environmental impacts per pound of product for a series of processes that constitute the supply chain. This allows companies to evaluate and compare metrics

<sup>34</sup> *Ibidem.*

for individual processes as well as for the entire supply chain. The items for each metric may differ depending on the operation and the industry.<sup>35</sup>

In addition to the basic metrics, complementary metrics may be developed to address specific needs. They include:

- metrics that emphasize certain elements of the basic metrics (e.g. the toxic raw materials metric emphasizes an element of the basic material metric);
- metrics that cover elements not usually included in the basic metrics (e.g. the transportation energy metric complements basic energy metrics, use of packaging materials and energy for transportation, and the amount of rainwater contaminated by the industrial operation);
- metrics that weigh the inputs and outputs with respect to their impact potential (e.g. toxicity and global warming potential).

An important characteristic of BRIDGES' sustainability metrics is their scalability. That is, they can be scaled for different boundaries such as around a process, a facility, a business unit, or a product supply chain. Given appropriate boundaries, the metrics can be aggregated using simple algebraic equations, e.g. process-level metrics aggregated to form a facility-level metric. Conversely, a facility-level metric can be disaggregated to produce process-level metrics through the use simple allocation rules.<sup>36</sup>

Sustainability metrics has also been adopted as a software tool that offers a variety of metrics for measuring sustainability performance.

### **International Organisation for Standardization**

International Organisation for Standardization (ISO) gives recommendations for environmental performance indicators as part of ISO 14031. ISO 14031 standard defines three types of indicators: environmental condition, management performance, and operational performance.

Environmental condition indicators provide information on local, regional, national or worldly condition of the environment. As most factors which contribute to overwhelming majority of environmental conditions are beyond the organization's control and impact, these indicators are not used by individual organizations. However, they may be useful in the evaluation of the achievement of general goals (social, national).

Management performance indicators provide information on the attempts of the management in order to influence the environmental performance resulting from the company's social activities. These indicators, called leading indicators, which are expected to have an impact on future performance. They refer to activities undertaken by the company's management aimed at improving the effective-

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<sup>35</sup> P. Rao, A.K. Singh, O. la O'Castillo, P.S. Intal Jr., A. Sajid, *op. cit.*, p. 17.

<sup>36</sup> B. Beloff, D. Tanzil, G. Ma, *op. cit.*, p. 5–6.

ness of environmental activities and reflect the efficacy of such activities. Usually these indicators are related to policies or procedures. Expenses on staff training or the actual number of implemented projects including environmental aspects are examples of measurable managerial activities.

Operational performance indicators are the third type of indicators in ISO 14031. They provide information on the actual impact of the organization's activities on the environment. They concern elements used on input, such as the amounts of used energy and raw materials, and elements used on output such as products, waste, emissions, etc., the project itself, its implementation and operation (including emergency and non-routine operations) as well as maintaining machines and the equipment used by the organization. The aim of the indicators included in this category is to show the direct impact of a given organization on the environment without indicating future occurrences, therefore these are lagging indicators which measure the degree of goal achievement.

Managerial performance indicators provide vital information and recommend future improvements pertaining to environmental activities. As managerial indicators they reflect the intentions of the management and indicate the range within which the management solves environmental problems. Operational output indicators inform on what happened in the past period however they do not provide any effectiveness measurements nor points of reference that would enable evaluation of costs/profits for the benefit of the environment or the company. Environmental condition indicators do not measure the impact on the environment however any changes thereof may provide helpful information on the correlation between the condition of the environment and the activities, products, and services of the organization.

### **Global Reporting Initiative – Sustainability Reporting Guidelines**

According to GRI, in respect to corporate social responsibility, the company's report should include:

- visions and strategies referring to the problem of the company's balanced growth,
- review of the company's structure of activities,
- structures and methods of management with the inclusion of stakeholders,
- GRI Context Index with the determination of the location of the information in the report,
- output indicators which evaluate the company's impact which include economic, environmental, social and integrated performance indicators.<sup>37</sup>

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<sup>37</sup> T. Dąbrowski, *Reputacja przedsiębiorstwa. Tworzenie kapitału zaufania*, Wolters Kluwer business, Warszawa 2010, p. 125–129.



When creating a GRI report, the following rules, which are divided into four categories, should be followed:

- to facilitate the construction of the report – the principle of transparency, inclusiveness of all groups of stakeholders, and auditability;
- to facilitate the decision on what type of information should be included in the report – the principle of completeness, relevance, and preservation of sustainability context;
- in respect of the information communicated – to ensure quality and reliability of the data – the principle of comparability between different entities, accuracy, and neutrality;
- to ensure the accessibility of the contents of the report – the principle of clarity and timeliness.

A GRI standard includes a set of 79 economic, social, and ecological indicators aimed at providing information on the impact of the organization in the conditions of sustainable growth. Indicators additionally cover new practices or practices related only to particular organizations (additional indicators). Economic indicators allow a concise and comparable way to describe economic performance. Social indicators allow to assess the social dimension of an organization's impact on the society.<sup>38</sup>

Environmental indicators are divided into two types: general purpose for all organizations regardless of sector, location or other characteristics, and organization-specific, such as silviculture management and noise management.

The environmental dimension of sustainable growth refers to the organization's impact on living and inanimate nature, including ecosystems, soils, atmosphere, and waters. Environment Performance Indicators show the impact of the organization on the environment and include results related to production process factors (e.g. materials, energy, and water) and the effects of the production processes (e.g. emissions, outflows, waste). Furthermore they include the results related to the impact on biodiversity, information on compliance with environmental protection regulations, and other vital data such as expenditures on environmental protection or the impact of products and services on the environment. The applied distinguishing of particular aspects in the set of environmental indicators is to reflect input and output products and types of impact the organization exerts on the environment. In this standard, indicators are oriented at the performance and can be used to analyze changes in time, provided the results are comparable on annual basis.<sup>39</sup>

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<sup>38</sup> J. Nakonieczna, *Spoleczna odpowiedzialność firm międzynarodowych*, Difin, Warszawa 2008, p. 118–119.

<sup>39</sup> GRI Guidelines, [www.globalreporting.org](http://www.globalreporting.org).

## Conclusions

The Balanced Scorecard of an ecological nature can be elaborated for proecological business models. Metrics and indicators from various sources can be used. Leading and lagging indicators are most important and useful ones, whereas the descriptive ones are least significant.

The BSC can be elaborated for various subsidiaries acting within a holding, as well as for the mother company. Subsidiaries can be convinced to take into consideration strategic wishes of their mother companies in order to create an ecological perspective. Separate Balanced Scorecards can be elaborated on various levels of the company, e.g. for the whole company as well as for managers of particular sections, departments, and divisions<sup>40</sup>. Using the BSC, the company's strategy assumed for the period of 2–5 years, can be translated to strategic and operational activities, with interrelation of strategic and operational goals, included in the budget.<sup>41</sup>

Taking into account the presented opinions, the authors are of the opinion that the ecological aspect should be reflected in each of the business models accomplished by the company, complete with the presentation of such assumptions in the BSC elaborated for the company. The decision on supplementing the so far perspectives with ecological aspects or creating a new ecological perspective will depend on the adopted organizational strategy and the fact whether the ecological factor was taken into consideration in creating competitive superiority. If ecological values are clearly articulated by the mother company, the chances exist they will be respected also by subsidiaries, for example by creating separate ecological perspectives by daughter companies within the frames of proecological business models under accomplishment.

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### Summary

A business model has become a platform for implementing effective growth strategies of organizations on the market. For companies which follow the rules of corporate social responsibility ecological criteria are of particular importance (proecological business model).

Analyzing the role of particular measures, the authors are presenting the possibilities of using the Balanced Scorecard (BSC) of proecological character.

### Streszczenie

Model biznesu staje się dzisiaj platformą do wdrożenia skutecznych strategii rozwoju przedsiębiorstw na rynku. Powinien on umożliwiać przedsiębiorstwu elastyczne dostosowywanie się do zmieniającego się otoczenia. Jednak charakter tego otoczenia może się zmieniać w różny sposób i najlepszym rozwiązaniem byłby model pozwalający uruchomić te jego elementy, które są przydatne w istniejącej sytuacji. Budując model biznesu, należy uwzględnić specyfikę sektorów działalności, również w odniesieniu do aspektów ekologicznych. Dotyczy to przede wszystkim sektorów stwarzających zagrożenie dla środowiska naturalne-

go, zwłaszcza w skali regionalnej. Dla przedsiębiorstw kierujących się zasadami społecznej odpowiedzialności biznesu kryteria ekologiczne nabierają szczególnego znaczenia. W niniejszym opracowaniu autorzy prezentują możliwość zastosowania strategicznej karty wyników (Balanced Scorecard – BSC) o charakterze proekologicznym, analizując rolę poszczególnych mierników (Environmental Indicator System (EIS), European Environmental Agency (EEA), International Standards Organization (ISO), Bridges to Sustainability oraz Global Reporting Initiative (GRI) w realizacji proekologicznego modelu biznesu.

