# *Balanced Scorecard* as a Management Model in the Waste Sector

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## EXECUTIVE SUMMARY

All Organizations recognize that internal methodologies and frameworks are very important to have a thorough knowledge of their potential, simultaneous increase competitiveness and, correspondingly, enhance and optimize the performance of their service.

Waste management is a challenge of modern society, and there is awareness that responsibility of waste management should be shared by all community, to cooperate and ensure a sustainable development with the best principles and best management practices. It is a citizenship issue, where citizens contribute adopting preventative behaviours in the production of waste, as well as practices that facilitate waste recycling, reuse and recovery, which contribute to reduce the waste life cycle.

This concern and the service improvement involve the minimization of the environmental impacts, the conservation of the natural resources, the reduction of pollutant emissions, as well as the design of the solutions for the collection, transfer and transport, treatment and waste final deposition, and the allocation of human and financial resources.

The need for a sustainable management of resources has led to the design and development of management models in waste systems to assess in what extent the various tasks or activities are (or are not) carried out in accordance with the objectives established in advance and the efforts, decisions and operational actions developed by organisations to improve the quality of its work.

Thus, given the problems and requirements of the waste sector, it is necessary to outline and plan sustainable strategies for the management system. Therefore, the objective of the present work is the application and study of key concepts related to design and implementation of a management model, the Balanced Scorecard (BSC).

This is a management method based on critical success factors, which propose is to translate through a systemic approach, the mission and strategy of Organizations (private or public / non-profit) in operational objectives, arranged into perspectives interconnected in a cause-effect relation. It connects the strategic objectives to measurable measures (performance indicators) that indicate the success or failure of the adopted strategy, contributing to a review.

The BSC is a very useful and simple management tool, which perfectly suits the needs of the waste sector. It works as a measurement and management system, and a basis for the strategy communication to all elements of the system, and through a joint analysis, demonstrates of the

importance of all stakeholders to the overall management, encouraging their involvement and motivation.

**Keywords**
*Waste, Sustainable Development, Management Model, Balanced Scorecard, Strategy.*

## INTRODUCTION

The sudden population growth and increased life standard, lead to consumerism, resulting in a significant increase in waste. The waste production and capitation displays, since the 90's, a growing evolutionary trend (Figure 1). For about 20 years each inhabitant produced on average 0.8 kg of waste per day, while each portuguese citizen currently produces approximately around 1.3 kg daily.

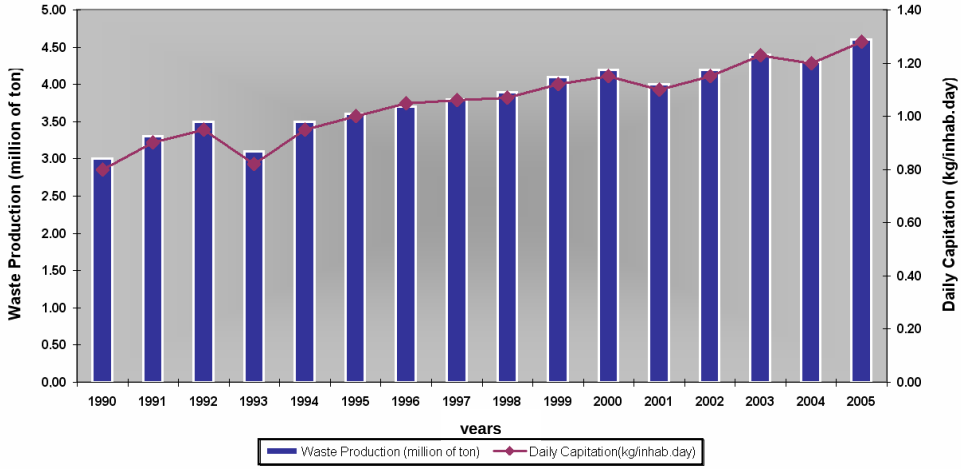


**Figure 1** Evolution of waste production and capitation in Continental Portugal
(Adapted from: Ministry of Environment, Planning and Regional Development, 1999 and 2007).

This increase in waste production, without the adoption of minimizing measures, results in serious environmental problem, social, political and public health. It also causes irreversible damages to natural resources, and considerable economic costs associated with their management.

According to Matos *et al.* (2008), the motivations for the waste management have been changing over time, recognising that they depend on the economic and social development of societies.

The Community Strategy for Waste Management emphasizes the need for environmental education of citizens, because increasingly the responsibility for the waste management requires awareness and should be shared by all of the community. It became a citizenship issue in with citizens contribute adopting preventative and selective behaviours in waste production, that facilitates waste recycling, reuse and recovery, contributing to decrease waste life cycle.

Waste management is a compelling challenge of modern societies, which waits for innovative solutions that ensure sustainable development with best principles and practices.

### Waste Management and Sustainable Development

Waste management considers all stages of their life cycle, it comprises the activities of technical, administrative and financial operations, deposition, collection, transport, storage, treatment, recovery and disposal of waste, including the monitorization of the local deposition after the closure of premises, as well as the planning of such operations (Figure 2).

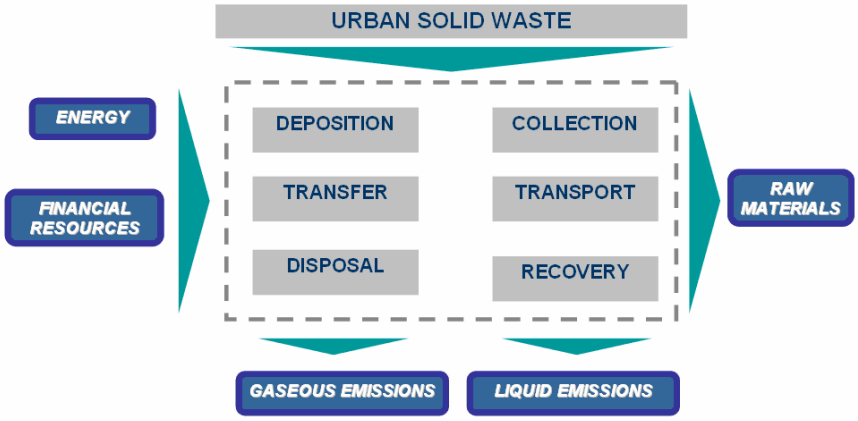


**Figure 2** Waste Management Systems

Waste management is an important environmental and social problem that requires the adoption of a comprehensive and coherent global policy management directed towards sustainability. This policy should focus on preventive strategies aimed the best principles of preservation of public health, economy, conservation of resources, aesthetic and environmental principles. It also aims the minimization and prevention of waste production followed by the warranty of deposition, collection, transportation, transfer and appropriate treatment, to ensure its recovery through recycling.

Recycling is an important tool in the context of sustainable use of resources, but it needs to be complemented with deeper measures of dematerialisation, i.e. increase on the efficiency of resource use (Matos *et al.*, 2008). The final disposal of waste, landfill, is the last option management, justified only when is technically or financially impossible prevention, reuse, recycling or other forms of recovery.

**Waste Management Systems**

A waste management system is a structure of human resources, logistics, equipment and infrastructure, established to carry out the operations inherent to waste management. According to Teixeira and Beja Neves (2006), and the stipulated in national legislation, the interveners responsible in management are called Managing Entities of waste management systems. It is of their competence the assurance of the regulation, guidance and monitory the conception, implementation, management and exploitation, as well as the regularization of the balance between economic sustainability and quality of services.

According to the national legislation, the authorities responsible for the management of urban waste – waste from housing as well as another waste that by nature or composition is similar to the waste from housing, and does not exceed the daily production of 1100 l by producer – are the *Municipalities*. These have autonomy to develop strategies, actions and procedures that allow the concretization of the Strategic Plan for Solid Urban Waste (PERSU) established priorities (MAOTDR, 2007). This plan aims and operates hierarchically: first prevention (reduction and reuse), followed by treatment and recovery (recycling and recovery) and, finally, containment insurance (incineration or landfill).

Municipalities are currently assimilating the need to provide themselves with methodologies that apart from help in a sustainable management in accordance with the guiding principles of PERSU, also contributes in the costs and waste production reduction. To this end, they use the participation of all society segments in articulated form, in particular, the inter-municipals consortia's, being the scheme management considered joint.

The design and development of management models in waste systems allows to access in what extent the various tasks or activities are (or not) carried out in accordance with the objectives established in advance and efforts, decisions and operational actions carried out by Organizations to improve the quality service (Teixeira and Beja Neves, 2006).

Therefore, the objective of the present work is the application and study of key concepts related to design and implementation of a management model, the Balanced Scorecard (BSC).

## BALANCED SCORECARD (BSC)

The BSC is one of the best management methods arisen in recent years. It was originally created in the early 90's, more precisely in 1992, by Kaplan and Norton to resolve performance problems, being used as a tool of management control. However, most recently, it appeared as a tool for implementing new strategies in any type of Organization (private or public sector), and on value creation for the customer (Anderson and Lawrie, 2002).

According to Pedro (2004), Kaplan and Norton created this tool to extend the vision of systems control beyond the traditional financial indicators, in several senses regardless of the sector of activity, including:

- Financial information and non - financial information;
- External and internal information;
- Continuous information about the organizational performance;
- Information's about the current and future results.

It appears from the fact that financial indicators demonstrate results, information of the past, and do not consider external factors which influence the Organization. It is not possible to monitory the process evolution nor acts. Only after the examination of the financial results it is possible to act, when it could be already too critical for the Organization (Cruz, 2006).

The use of non - financial information, the so-called intangible assets, can lead to a picture of the progress and Organization development, long before the analysis of financial results, allowing some scope for action and decisions (Cruz, 2006). The intangible assets can be: trademarks value, management ability, Organization's culture, leadership, know-how of human resources, share market, service quality, satisfaction and management ability of the relationship with customers, systems and information technologies potential, databases, and others (Pinto, 2007). Saragoça *et al.* (2006) referred that this is a management model which intends to:

- Clarify and translate the vision and strategy;
- Communicate and associate objectives and strategic measures;
- Planning, establish targets and align strategic initiatives;
- Improving the feedback and strategic learning;
- Monitoring the strategy implementation.

According to Kaplan and Norton (1992), regardless of the sector, BSC is a management tool that has simply the objective to translate in an easy way the vision, mission and strategy of an Organization, in strategic operational objectives organized into four perspectives: finance, customer, internal processes and learning and growing of collaborators. These operational objectives are related to each other in a chain cause - effect, schemed in the form of a strategy map, which promotes the feedback and allows a follow-up and monitorization of the decisions developments on the Organization through indicators described in a scorecard.

**BSC Perspectives**

The financial or non – financial perspectives are interconnected in a cause-effect relation and cannot be independently viewed (Passos, 2004). This allows more easily the assessment of the achieved results, because there is an interconnection of the performance measures with the objectives set according to the overall defined strategy (Gomes, 2006). These perspectives demonstrate the commitment of an Organization to build a sustainable global economy in areas such as the quality, environmental protection, security and social development.

The Financial Perspective reflects the concern with the financial performance, i.e. ensures the Organization's survival and growth. It involves relevant variables, for example, the return of capital and yield of the capital invested, an investment percentage, net profit, among others (Kaplan and Norton, 1996). These measures should be differentiated in each stage of Organization's life (growth, maintenance and maturity), and be depend on the desired financial objectives (such as profitability growth, reducing costs and improving productivity, use of assets and investment strategy) (Gomes, 2006).

Within the Customers Perspective, the main objective is the customer identification, their needs and market segments where the Organization wants to compete, in order to align their essential measures for success: satisfaction[1], market participation[2], loyalty / retention[3], capitation[4] and profitability[5]. After dealing with the customer's perspective, it is necessary to check if the outcomes will affect the entire Organization chain value, from operational, logistics, development of products and services, distribution till marketing activities.

The Internal Processes Perspectives represents the set of activities and actions developed. It monitors and analyzes the adequacy of internal processes for customer's satisfaction and financial optimization. The internal processes chosen normally derive from the objectives and indicators selected in the customers perspective (Pedro, 2004), distinguished in Innovation Processes, Operations and Customers Support.

The generic values chain for the private sector includes steps that start with the current and future needs of customers identification (innovation), passing through the processes of production and distribution to the process of after-sales service, so that meets the expectations of customers in a rather short and long-term (Rossetto, 2003).

The Learning and Growing Perspective includes in the value creation in the Organization, a set of intangible values, in particular Human Capital, Information and Organizational (Kaplan and Norton, 1996).

Furthermore, it reflects the Organization's assets related with the capacity to learn and improve. According to Gomes (2006), it also emphasizes the importance of investment, not only in the development of new products and services, but also in infrastructures, such as: persons (training, capacity, motivation and commitment), management and information systems (ability to provide information in good time) and organizational procedures (powers delegation, motivation, creativity stimulating, objectives coherence).

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[1] **Satisfaction –** It measures the lever of customer's satisfaction in accordance with specific performance criteria within the proposition value (Rossetto, 2003).

[2] **Market Participation –** It reflects the business proportions in a given market (in terms of customers, expense or unit volume sold (Rossetto, 2003).

[3] **Loyalty/Retention –** It controls in absolute or relative terms, the intensity with which a business unit holds or maintains ongoing relationships with their clients (Rossetto, 2003).

[4] **Capitation –** It controls in absolute or relative terms, the intensity with which a business unit conquest or attract new customers (Rossetto, 2003).

[5] **Profitability –** It measures the net profit of customers or segments, after deducting specific expenditure necessary to sustain these clients (Rossetto, 2003).

This perspective establishes crucial cause - effect relations with the remaining perspectives, treating intangible assets as strong actions and results promoters (drivers) in BSC. The compliance with the strategic objectives results of an upgrading of human resources investment, which consequently triggers greater competence, productivity and motivation of staff (Redsigma, 2005).

**Perspectives Adaptations – Private and Public Sector**

According to Pedro (2004), the BSC originally designed for enterprises (private sector) presents a methodology that allows adaptation to all kinds of Organization, public or private. Dávila (1999) defends that the most commons perspectives are the ones already presented by Kaplan e Norton. However they do not constitute a necessary condition for the model to work. Perspectives should be adapted to the needs of the Organization, which may give new perspectives or adaptation of the already existing in the Kaplan and Norton model. In the definition of these perspectives, Fernandez (2002) states it is very important the interconnection between them. Ribeiro (2005) referred that perspectives can be more than four, but it is unusual to find more than six.

The value chain of private sector is different from the public sector. While the private sector is directed to finances, in particular, profits according the needs and expectations of clients, the public sector demand firstly fulfil its mission and serve customers / population.

Thus, when analysing the original BSC model (private sector), it appears, as a guiding principle to the other three perspectives, the financial perspective, while in the public sector, where it is given a greater importance to the satisfaction of the community, the mission is placed at the top of the BSC, as well as the customer's perspective (Figure 3).

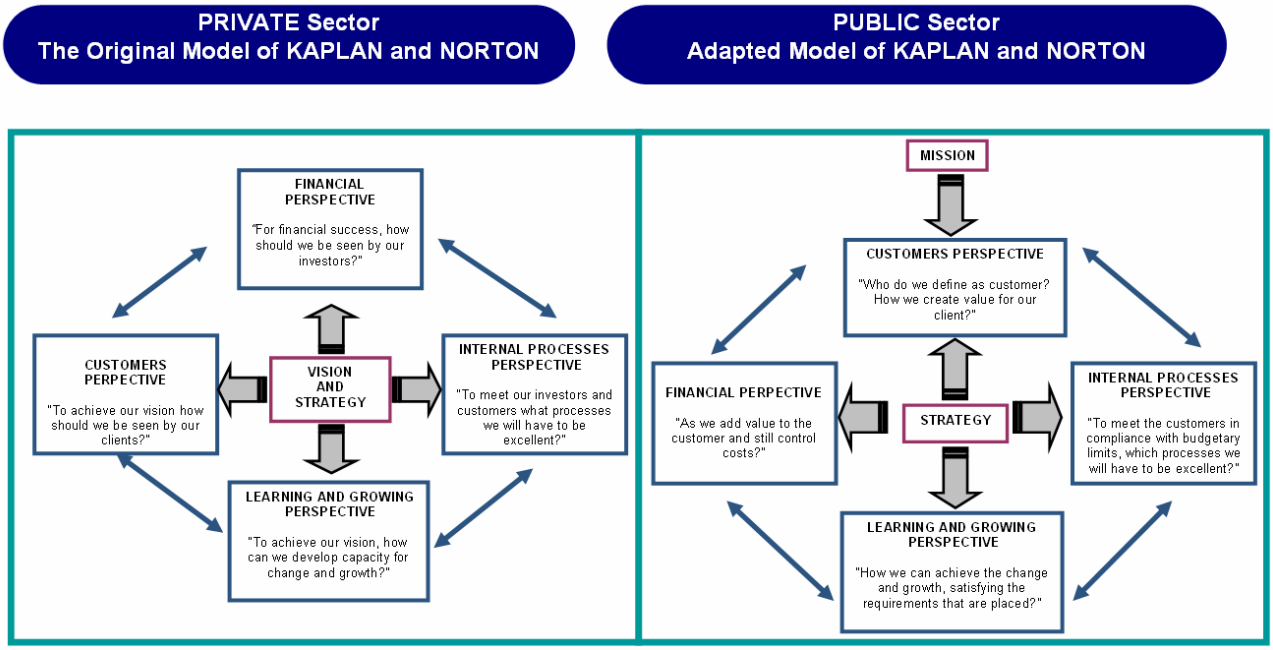


**Figure 3** Balanced Scorecard – Private and Public Sector (Adapted from: Pinto, 2007)

The BSC structure allows that, for each perspective, a question can be presented, and for which is necessary to define the objectives that answer to the question, the adequate goals, the measures or performance indicators to be used to measure the objectives and the actions to execute (Gomes, 2006).

**Development and Implementation of BSC**

The design, development and implementation of the BSC regardless the sector have several phases. First phase is the definition of the mission, values and vision of the Organization in accordance with the operations and the SWOT analysis (strengths, weakness, opportunities and threats). Critical

success factors are identified from which the sustainability strategy is defined with the guidelines for the Organization functioning, and later, the development of the strategy, as Figure 4 shows.

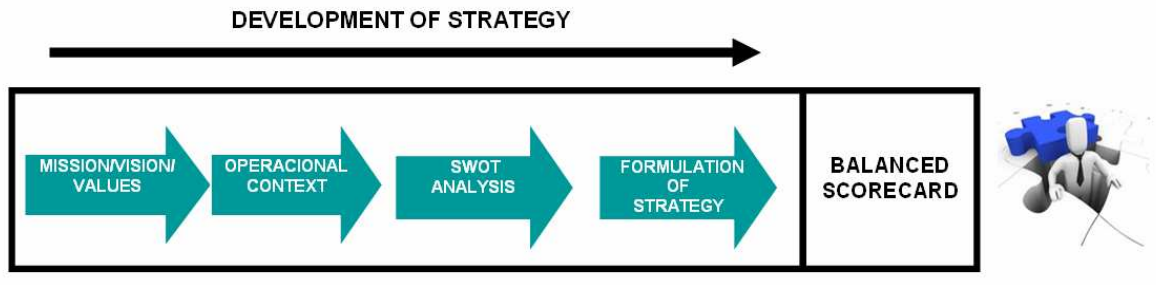


**Figure 4** Development of Strategy

Then, the implementation of strategy is made as represented in Figure 5. It is presented in a simplified form through a strategy map, which is a dynamic and interactive structure that allows actualizations, connected to strategic objectives, in a cause-effect relation, explaining which measures are necessary to achieve each objective and targets. To monitor the implementation of these measures, performance indicators are used, which have associated goals, and allows building a scorecard.

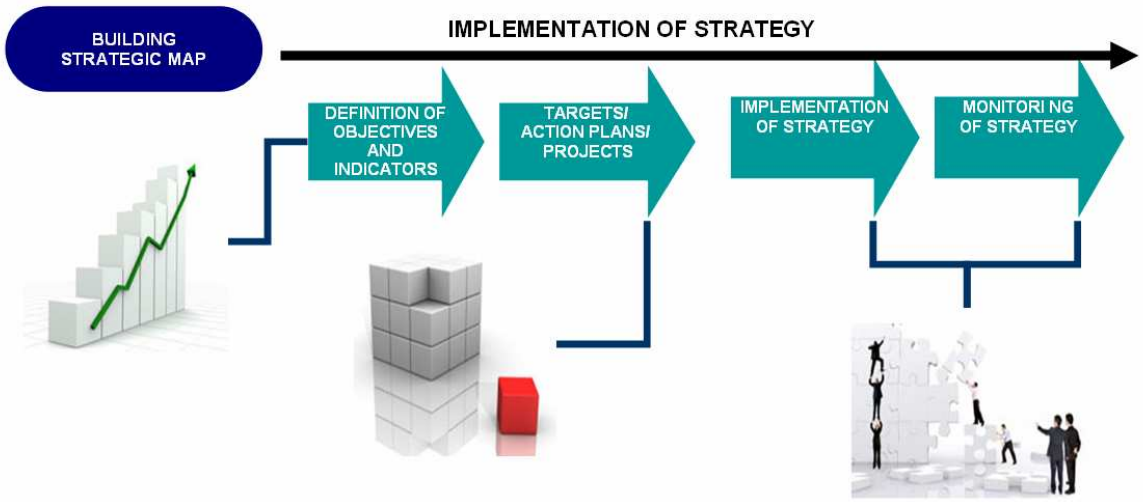


**Figure 5** Implementation of Strategy

The scorecard is a table that contains only enough information (maximum of 25 measures distributed through different perspectives) and allows the analysis of the results obtained by strategic Performance Indicators (PI). The results provide an overview of the Organization performance and function as a performance motivator (Butler, *et al.*, 1997).

The performance indicators can be used to confront with a pre established or an historic evolution comparison, using them as a reference for benchmarking (Alegre, 2002 and Matos *et al.*, 2004).

So, with the monitozation of the indicators and the realization (or not), of the targets outlined, it is possible to assess the performance of the Organization. Therefore, measures / actions are developed under a continuous improvement in order to align the strategy of the Organization, resulting in the design of action plans / projects.

**BSC and the Waste Sector**

The managing Entities of waste management systems have a thorough knowledge of the problems surrounding the sector, facing diverse needs and difficulties. Thus, for social and behavioural

trends, it is imperative that the Managing Entities equip themselves with instruments and adequate resources, controlling and ensuring the strategy and performance of their services.

In this context, BSC fits perfectly on the needs of the sector, because it is very a useful and simple management tool, which allows an involvement and motivation of all levels of management. It communicates the strategy to all elements involved in waste management and allows the formulation and integration to other management systems.

It uses balanced and integrated metrics at all levels, with established targets that create incentives indicative of performance improvement in processes, allowing a real-time monitoring of the strategic objectives. These measures are useful since they allow an assessment of development and performance, providing a comparative monitoring of conditions and operations.

The monitorization in terms of benchmarking performance is promoted by PERSU, being very useful inter-Organizations, driving competitiveness and sustainable growth. It allows a review and an improvement of the strategy, focus on solving the critical success factors and development of their potential, in particular, the allocation of resources.

## CONCLUSIONS

The competitiveness and success of any Organization, public or private, in the actual information and technologic society, are determined by its ability to manage strategically all its resources from the operational to the financial. The complexity of the products, services and key processes of the Organizations, create a broader approach, undertaking the design and implementation of new tools that enable Organizations to review the strategies, providing themselves with ambitious innovation models.

With this intuit, Balanced Scorecard, was created, which is a revolutionary concept that changed the form of Organizations management. This is a model that allows: translation and clarifying the vision and strategy, communication and connecting of objectives and indicators, strategic planning and establishment of objectives, strategic initiatives alignment and increase in the feedback and learning.

From an integrated vision of the Organization, the BSC allows integration of the essential for the Organization, describing in a more clearly way the strategy through strategic objectives that are grouped into four perspectives: financial, customer, internal processes and learning and growing. These perspectives are linked through a cause-effect relation illustrated in a strategy map, that allow managers to understand the correlations between the various areas and activities, which is compatible with the continuous improvement and innovation processes, including integration with other management systems.

This cause-effect relation creates a systematic process that ensures a chaining between the objectives of the perspectives, to reflect the undertaken relations initially formulated in to strategies. To ensure that the Organization is in the right direction to succeed, the BSC monitors in almost real time through indicators, the performance, becoming a milestone for analysis, support and making decision.

This is a dynamic and educational process of permanent learning and innovation, which allows better allocation and mobilization of resources available in order to achieve the required. It is a flexible management model, which allows an adequacy and formulation to problematic sectors, such as the case of waste, requiring best principles and practices of sustainable management.

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