



# EMPLOYING THE BUDGET OF SUSTAINABLE CONTINUOUS IMPROVEMENT AND GREEN TARGET COST TO ACHIEVE COMPETITIVE ADVANTAGE

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## ABSTRACT

The research aims to lay the knowledge foundations for some contemporary management methods in cost accounting and management accounting, which is represented in the balance of sustainable continuous improvement and green target cost technology, and work to show the impact of green target cost technology in providing information. About the costs that are allocated in order to preserve the environment and natural resources at the lowest costs and focus Benefits of sustainable continuous improvement technology due to the cost-saving information it provides The researchers used data from the economic unit and field contacts with the employees of the Kufa Cement Factory to conduct a current analysis of the research sample represented by that production company to enable the economic unit to switch from traditional products to green products, thus achieving cost savings. Budget sustainable continuous improvement aims to strengthen the industrial process. A number of recommendations were made in light of these findings, the most important of which are: Improving financial and non-financial information giving systems and helping management to make sound decisions in resource management, The study sample should adopt contemporary cost and administrative procedures. The results of the study supported the need to implement the target green cost and balance the balance between Budget sustainable continuous improvement and the benefits that arise from this balance Lower product prices and environmental protection and gain a competitive advantage.

**KEYWORDS:** Budget sustainable continuous improvement, green target cost, Competitive advantage.

## I. INTRODUCTION

Technological progress in countries around the world and the production of green products by economic units and the emergence of competition between economic units led to a change in customer tastes, which makes economic units always try to protect their products by gaining customer satisfaction and meeting their needs, and to carry out the process of acquiring more customers and enhancing competitiveness, through the production of goods with a competitive advantage. The main problem studied is the intense competition faced by economic units due to the presence of a large number of high-quality and affordable products, the pressure faced by economic units from world companies and their orientation to produce green products. The research aims to study the appropriate solutions to the problems facing the economic units and these problems are the large number of competing products in addition to the environmental problems that accompany the production process and to solve these problems is done through the use of modern costly techniques that seek to serve the environmental issues of the target green cost and the balance of continuous sustainable improvement that aims to provide a suitable green product to customers at competitive prices and this is achieved by reducing the costs of the product. The importance of the research is the following points: Clarify the concepts of green target cost, and balance sustainable continuous improvement. Work to show the role of green target cost technology and balance sustainable continuous improvement in achieving competitive advantage. The green target cost contributes to providing a green product at an appropriate cost, in addition to that it is characterized by taking into account the environmental aspects, unlike the traditional product, and the sustainable continuous improvement budget provides information that will reduce the costs of the product, improve its quality, reduce its production time, and deliver the product to the customer in the least time and as a result achieve competitive



advantage. The research is based on the hypothesis that: "Employing and Budget sustainable continuous improvement and green target cost contributes to delivering green products and an appropriate cost that leads to competitive advantage".

## II. LITERATURE REVIEW

### **The First topic / the knowledge foundations of the technique of Budget sustainable improvement nails**

#### **First. The concept of Budget sustainable continuous improvement**

(Orastean et al.2018:101) argue that the concept of sustainability is to make economic and social improvements in coordination between technological progress and investment during the use of natural resources, as well as to make continuous improvements on certain aspects of production processes, to preserve the environment and meet the needs of the current generation and preserve the resources of future generations. (Blocher et al.2010:14) suggests that it is a balance between the economic unit's short-term and long-term goals in terms of social, environmental and financial performance, as well as finding and implementing solutions. It can do this by employing technological innovation and continuous improvement to products and developing new products, taking into account reasonable measures and methods to enhance the social and environmental aspects of the activities of the economic unit, in order to save costs and increase income while adhering to social and environmental rules and expectations.

#### **Secondly. Objectives of Budget Sustainable Continuous Improvement:**

Budget sustainable continuous improvement seeks to achieve a number of goals: (Hoengren et al,2015:220), (Pazarceviren et al,2015:219-221).

1. The budget for sustainable continuous improvement aims to encourage economic units through planning and implementation of development policies to maintain community life economically, environmentally and socially and to take a set of small adjustment steps instead of large improvements, that is, it requires a gradual and continuous cost reduction process.
2. Budget sustainable continuous improvement and increasing community awareness: It aims to provide modified estimates of continuous improvements by preserving natural resources, assisting the economic unit in evaluating performance, comparing them with real results, and identifying deviations in the set goals.
3. Budget sustainable continuous improvement and technological development: Highlighting a comprehensive study on development developments through the use of modern technologies that contribute to reducing costs, reducing emissions and waste, and knowing the importance of analyzing political, economic and social conditions with a comprehensive and integrated vision and preserving the available energy resources.
4. Achieving goals and objectives: Economic units seek to increase their profits through the exchange of experiences and skills, activating learning and training, increasing the efficiency of production processes, and achieving a good competitive position among economic units by reducing costs and solving environmental problems.

#### **Thirdly. Advantages of Budget sustainable continuous improvement:**

Many of the advantages that can be achieved when applying the sustainable continuous improvement budget can be formulated (Wright,2020:1),(Al-Kasab, 2004:11).

1. Providing funds for changes and sustainable improvement: Providing the necessary funds for changes the economic unit undertakes projects with good returns, achieves cost savings, improves performance, and incorporates these changes in the budget.
2. The sustainable continuous improvement budget clearly defines priorities and the consolidation of initiatives that are compatible with sustainability in order to reduce costs and improve performance to make the economic unit to integrate the budget with the dimensions of sustainability and make continuous improvements.
3. The sustainable continuous improvement budget seeks to involve employees and give them independence and a sense of responsibility to achieve the goals and management's knowledge of sustainable improvements that can be made in the production stages and is one of the control tools for all levels of management to control production processes.
4. Budget sustainable continuous improvement helps management to be fully aware of operations and how to improve them by negotiating with vendors about the sustainability of the supply chain, and searching for suppliers whose values are consistent with the values of the economic unit to preserve the environment.



## **The Second topic: knowledge foundations of the green target cost technique**

### **First: The concept of the green product**

The concept of the green product has been studied by many researchers and writers in cost and administrative accounting, including (Peattie,1992:105), who pointed out that the green product (GP) is a set of comprehensive procedures and modification of standard products to ensure consumer safety, protect the environment and avoid harm to the environment, while (Zakaria,2005: 97) believes that green products are the continuous improvement of industrial processes, goods and services in order to reduce resource consumption. While (Chen,2010:29) sees green products combining environmental strategies and manufacturing methods by using recyclables to obtain less harmful materials in order to protect the environment by preventing pollution and depletion of its natural resources. He adds (Moussa&Jameel,2012:51) Green products are manufactured through processes that reduce the use of natural resources, use raw materials that adhere to environmental requirements and standards, and modify existing production processes to reduce levels of damage and pollution during waste reuse through waste collection and treatment.

### **Second: The importance of the green product**

(Herrero et al.2009:9) and (Ma et al,2017:3) indicate that the green product is of great importance, and this importance is concentrated in the following:

1. Reduces pollution and promotes the use of natural resources.
2. Trying to find solutions to environmental issues that arise during the production process.
3. Assist economic units in gaining their competitive advantage.
4. Work to improve the economic unit's revenues and profits, which leads to an increase in market share.

### **Third: Creating Sustainable Green Products**

It seems that the majority of economic units are engaged in the production and marketing of environmentally friendly products in order to address a variety of issues. One of these problems is how to combine the advantages of environmentally friendly products with the advantages of traditional products while maintaining a competitive price (dangelico & pujari,2010:480-479). competitiveness, economic units are rarely able to pass on the costs incurred by environmental requirements to customers in the form of a price premium. which is one of the factors slowing down the development of green products in many sectors of the economy. The reason is not a scarcity of the technology, but rather higher development and manufacturing costs that make it more affordable than conventional products in a number of product categories. In addition, there is no government support for companies, and it is difficult to compete with global companies and companies that have not invested in green products. There are additional attributes and features, such as product quality, that must be considered along with environmental sustainability, aesthetics, and reliability. The reason is not the scarcity of the technology, but rather the higher development and manufacturing costs that make it more expensive than conventional products in a number of product categories. In addition, there is no government support for companies, and it is difficult to compete with companies and companies that have not invested in green products. There are additional attributes and features, such as product quality, that must be considered along with environmental sustainability. Customers' insufficient understanding of the benefits of green products, the importance of their use, and the extent to which damages can be avoided as a result of using this type of product that achieves environmental sustainability is another challenge facing the economic units that develop and market green products. (Dangelico&Pujari,2010:480). The researchers believe that the green target cost technology is a development of the target cost determination technology, which is the result of matching the requirements of the target cost technology with environmental requirements and legal requirements, in order to meet the customer requirements that must be provided in the product and in a way that helps preserve the environment taking into account the environmental standards imposed by law and at reasonable costs.

### **Fourthly. Green Target Cost Concept**

(Nishimura.2014:56) defines green target cost technology as a technique that adopts the idea of integrating environmental concerns and issues into the traditional target cost model as a result of the increasing demand by customers and stakeholders to produce environmentally friendly products. before the legislative authorities and at appropriate prices and in a way that achieves the economic units the state of survival in the competitive market.



### **Fifthly. Rationale for applying the green target cost**

(Azzone,1994:69-70) states that the justifications or reasons that led to the pressure on economic units to apply the green target cost technique can be traced back according to the parties involved in the production of green products, which are as follows:

1. Green consumer: (Green consumer) is the consumer who is affected by environmental characteristics and is the main determinant in their purchase process.
2. : (Lobbyists are alliances that support and agree with environmental protection and support environmental business practices.
3. Green investors: They are investors who invest in economic units that support the environment. (Malone,2015:6) points out that economic units will face pressure from consumers when creating green products as they want to obtain products at a fair price, forcing economic units to incur higher expenses while making green products. As a result, the target cost was created in a way that took into account the requirements that must be met. To create green goods that preserve the environment.

### **Sixthly. Green Target Cost Application Steps**

#### **1. Identify and evaluate desirable green specifications and functions**

(Horvat &Berlin,2012:27-28) indicates that the process of identifying and evaluating the desired green specifications and functions is one of the most important steps in applying the green target costing technology, and it stems from determining the customer's requirements that must be provided in the product, and that determining green specifications and functions depends on Determining the characteristics of the product by studying these characteristics in detail, while conducting an in-depth study of the value of those characteristics, and taking into account the characteristics that enhance green products, which are a reflection of the environmental requirements that should be provided in these products. (Otto et al,2009:287) indicates Customers are willing to pay in order to obtain environmentally friendly and healthy products. In addition to the traditional requirements, green products need other requirements such as not containing toxic substances, recyclability, emissions reduction and other requirements in order to preserve the environment, noting that they are being developed green market needs using market research methodologies carried out by the economic unit.

#### **2. Evaluate the target selling price and green price premium**

(Horvath&Berlin,2012:28) points out that through the target selling price competitive market conditions and preliminary results about the selling prices of green products and the willingness of customers to pay for these products are analyzed, and that the green price can only be achieved under certain conditions, the most important of which is the desire of customers to pay a price premium for the green product, and that the customer's payment of the price premium is due to his confidence in the environmental benefits involved in the process of acquiring the product as well as paying that premium. It should be associated with the availability of some characteristics or characteristics related to the environment. There are several tools available to determine the green target price: (Eyefortransport,2009:13) (Lohre et al.2010:44) (Malone,2015:59).

- A. **Direct and indirect customer survey:** The direct survey process is done by asking a set of questions to current or potential customers regarding how they respond to price changes and their reactions, but in some cases there may be differences between the declared willingness to pay by customers and the actual customer behavior. As for the indirect survey, it asks customers questions about how to determine the process of estimating the characteristics related to the product, on the basis of which the target price is determined.
- B. **Analysis of secondary market data:** Under this tool, the target price is derived through the use of econometrics and the determination of the functional parameters of the inverse demand function as well as data conducted through market research and general statistics that are being performed.
- C. **Expert opinions:** Under this tool, employees with long experience in the sales department provide personal evaluations in order to develop the volume of sales when prices vary, and this method is fast and inexpensive, however, the quality of the results is based on the qualifications possessed by the experts.
- D. **Price Trials:** Under this tool, the behavior of the buyer is tested by changing the price in a systematic way during a specific period of time, with the price changing from one period to another, and this may be expensive and take a long time.

#### **3. Green Profit Margin Adjustment**

In the case of green products, it is necessary to adjust the target profit margin due to the presence of high efforts in terms of designing those products, which are related to environmental requirements that should be taken into



account (Al-Jadri,2018:45). It should be noted that all costs incurred over the life of the product must be covered by the selling price, including costs. Environmental (Horvath & Berlin,2012:28).

#### 4. Implement Green Target Cost Management Procedures)

This step is accomplished in four phases (Kersten,2011:445), (Horvath&Berlin, 2012:29).

- A. Calculate the current or actual cost of the product (modern techniques can be applied to calculate this cost).
- B. Compare the actual cost and the target cost and determine the target difference between them.
- C. Carrying out procedures to achieve the target reduction.

#### Third topic / integration between Budget sustainable continuous improvement and green target cost in achieving competitive advantage

##### First. The concept of competitive advantage:

(Porter,2004:8) explained how the competitive advantage arises that as soon as the economic unit reaches new discoveries, it is more effective than used by competitors, as it is able to embody these discoveries in the field. Competition means all efforts, procedures, innovations, and all administrative, production, and marketing activities. practiced by the economic unit to obtain customers, increase its market share, and expand the markets. (Kotler & Armstrong,2007:966) indicated that it is the advantage gained by the economic unit by providing great value to customers, at lower prices or by providing greater benefits that make the price rise justified. (Willie,2010:25) shows the progress achieved by competitors over their peers, and the widening gap between them as a result of the difference between the value that has been achieved for the customer and the financial value that is paid by the customer in order to obtain this product. (Lee,2011:48) indicated the competitive advantage that is achieved by having the ability to achieve a competitive advantage that competitors cannot imitate and develop. (Xu,2013:27) defines it as that product or service that is provided by the economic unit and is of high value to the customer when compared with the products and services of competitors. From the foregoing, the researchers believe that the competitive advantage is the position and ability of the economic units that reach them when they possess a set of characteristics and privileges or implement a package of measures that make them outperform competing units in meeting the needs of customers and achieving profits for their superiority in quality, low costs and high market share.

##### Second: The importance of competitive advantage:

(Safi,2017:100) pointed out the importance of competitive advantage as follows:

1. The competitive advantage is a weapon to meet the challenges faced by the economic unit in the markets and competitors by devoting its efforts to the development of capabilities that are interested in meeting the desires and needs of customers in the future through continuous improvement of production that makes the economic unit able to adapt to changing opportunities and speed of response to those changes.
2. It represents the criterion through which we determine whether the economic unit is successful than others, because the distinct and successful economic unit is ready to find new and distinct models and unique from other competing units and it is difficult to imitate them by competitors, because the old models have become available and known by competitors, so the economic units are looking forward to owning successive and accelerated innovations to make the unit with a better competitive advantage in all cases.
3. The competitive advantage represents a good positive indicator that the economic unit is heading towards having a strong position in the markets to obtain a larger market share compared to its competitors, which gives it opportunities to have more satisfied and loyal customers than competitors, which leads to an increase in sales and profits.

##### Thirdly. Dimensions of competitive advantage

**1. Cost and efficiency:** Economic units face constant pressure to reduce the cost of the products they sell, To calculate and manage the cost of products, managers must first understand the activities that cause the cost to appear in addition to monitoring the market and determining the prices that customers are willing to pay for products, while management accounting information helps managers calculate the target cost of a product by subtracting the part of the operating income of the product that the economic unit wants to earn from the "target price" to achieve the target cost, Managers eliminate activities and reduce the costs of performing other activities in all functions of the value chain from initial R&D to customer service, and many economic units reduce costs by outsourcing some of their business functions and moving them to other places where the cost of raw materials and operations is lower. (Horngren et al,2021:25).



**2. Quality:** Quality represents one of the dimensions of competitive advantage, and its importance is greater as a competitive strategy that economic units go to in line with the variables of the evolving business environment, and that the product has good performance that meets the desires and needs of customers, that units that do not give high attention to quality, they will face the risk of declining market share, which leads to a decrease in their profits. (Krajewski & Ritzman, 2005:194)., Customers expect high levels of quality, Quality management is an integrative philosophy of management for continuous improvement of the quality of products and processes. Managers who apply quality management believe that everyone in the value chain is responsible for delivering products and services that exceed customer expectations. Economic units use total quality management to design products that meet the needs and desires of customers and make products flawless And waste or waste is very little.

**3. Time:** (Hemmatfar, 2010:162) pointed to time as a competitive advantage that makes the economic unit able to exploit investment opportunities, and speed in delivering ideas to the markets.

**4. Innovation:** The continuous flow of innovative products or services is the **basis** for the continuous success of economic units Many units innovate in their strategies and business models, the services they provide and the way they market, sell and distribute their products, managers in giant units rely on accounting information management to evaluate the costs and advantages of research and development and investment decisions (Horngren et al, 2021:25).

The strategic vision of innovation consists of two dimensions, the first dimension is the ability of the economic unit to provide a wide range of products to meet the needs and desires of customers, or the second dimension is the possibility of the economic unit to quickly change its products to a new product, or change a production line to another production line quickly (Al Robaaiy, 2020:7).

**5. Sustainability:** Economic units are increasingly applying the key success factors of efficiency, quality, time and innovation to promote sustainability - and develop and implement strategies to achieve long-term financial, social and environmental goals, including efforts by economic units to conserve and recycle energy and resources, prevent pollution through designs for products that can be easily recycled and work on continuous improvement of sustainability, cost and quality of their products (Horngren, et al, 2021:25).

#### Fourthly. Competitive Strategies

**1. Low-Cost Broad Strategies:** Pursuing lower costs than competitors who target a wide range of customers is an especially strong competitive approach in markets with many prices' sensitive customers. An economic unit achieves low-cost leadership when it becomes the lowest-cost producer in the industry rather than being just one of several competitors with possibly relatively low costs. But the most important strategic goal for a low-cost product is significantly lower costs than competitors and not necessarily the lowest possible cost at all. In pursuit of a cost advantage over competitors, economic unit managers must incorporate features and services that customers deem necessary. Consumers may perceive a no-frills product offering as providing little value regardless of its price (Thompson et al. 2020:125).

**2. Focused low-cost strategy:** A focused **low-cost** strategy aims to secure a competitive advantage, by serving customers in the market, and selling products at a lower cost than competitors' prices. This strategy is very attractive when the economic unit can significantly reduce costs by limiting its customer base to a specific customer segment. (Thompson et al. 2020:138-139).

**3. Broad differentiation strategy:** It is possible for the economic unit to build the competitive advantage from this strategy, by making customers more loyal to the unit, and gaining their satisfaction with these products, which reduces the likelihood of customers looking for alternative products, and paying attention to the process of continuous improvement of the performance of the economic unit, and excellence in providing products and services to achieve the desires of customers in order to build a competitive advantage (Hansen & Mowen, 2006:14).

**4. Focused Differentiation Strategies:** What distinguishes focused strategies apart from large-scale, low-cost differentiation strategies is to focus attention on a narrow portion of the overall market. The target segment, or niche, can be in the form of a geographic segment, a customer segment, or a product segment.

**5. Hybrid strategies (best cost):** To profitably employ a best-cost strategy, the economic unit must have the ability to integrate high-end features into its product offerings at a lower cost than its competitors, so when a company can integrate more attractive features, good to excellent product performance or quality, or more

satisfactory customer service in its product offerings at a lower cost than its competitors, it has the status of "best cost" as it provides a low cost for a product or service with high-end features, and can For the best-cost producer to use the advantage of the low cost of its competitors whose products or services have similar high-end qualities and still earn attractive profits, the best costly strategies are a combination of low-cost and differentiation strategies, integrating the features of each simultaneously, and this allows companies to directly target the sometimes large mass of value-conscious customers, who are looking for a better product or service at an economical price (Thompson et al.2020:143).

### III. MATERIALS AND METHODS

#### Employing the sustainable continuous improvement budget and the green target cost in achieving competitive advantage in the Kufa Cement Plant.

The following will be addressed: -

First. Establishment of the company:- The General Company for Southern Cement was established on 20/6/1995 under Ministerial Order 2963, where it carried out its business in the half of the year 1995 with a capital of (871,500,000 ) Iraqi Dinar, and the capital of the company was increased in 1999 to the amount and capacity of (1,471,500,000) Iraqi dinars, where the company is located in the south of Najaf province between the district of Kufa and the district of Manathira, where it is (7.5 kilometers) from the center of Kufa district, and that the General Company for Iraqi Cement - Southern Assistants is one of the self-financing economic units, and is linked to the Iraqi Ministry of Industry, and has a legal personality with financial and administrative independence.

#### Determine the current cost according to the budget of sustainable continuous improvement.

To determine the current cost according to the budget, senior management needs information that enables and assists it in reducing costs, improving quality, and working on improvements within the organizational structure. The sustainable continuous improvement budgets for the Kufa cement plant for a full year, and accordingly, the sustainable continuous improvement budget will be applied after following the following steps: -

1. Determine the areas of improvement for which the sustainable continuous improvement budget will be prepared:
2. Diagnosis of problems in the cement plant in all areas that require improvement:
3. Work to find appropriate solutions by preparing a sustainable continuous improvement budget:
4. Preparing a sustainable continuous improvement budget.

**Table (1) The cost of one ton of resistant cement for the year 2021**  
(amounts in dinars)

monthly period	quarry stage	rubber conveyor stage	material grinding stage	The ovens	Cement mills	packing	Cost per ton before reduction
January	6,829	2,212	10,170	36,418	11,197	5,853	72,679
February	6,353	1,998	10,545	36,834	12,904	4,992	73626
March	7,042	2,089	10,947	35,913	12,923	4,943	73,857
April	7,420	2,264	11,342	37,198	11,159	5,272	74,655
May	7,378	2,157	10,882	36,845	13,155	5,589	76,006
June	7,835	2,325	11,468	39,713	13,376	5,487	80,204
July	7,950	2,349	11,635	40,509	13,580	5,737	81,760
August	8,006	2,344	11,960	40,997	14,114	5,925	83,346
September	8,333	2,410	12,016	42,371	14,153	6,086	85,369
October	8,502	2,479	12,223	42,924	14,576	6,146	86,850
November	8,832	2,547	12,343	42,823	14,805	6,381	87,731
December	8,723	2,475	12,334	42,800	14,500	6,350	87,182

Source: Prepared by the researchers based on laboratory data.

**Table (2) Balancing Sustainable Continuous Improvement after Including Reduction Rates as in 2021**

monthly period	quarry stage	rubber conveyor stage	material grinding stage	The ovens	Cement mills	packing	Cost per ton before reduction
Reduction Rates	1.25%	1%	8%	10%	5%	75%	
January	6,743	2189	10.089	36,381	11,141	4,816	71,359
February	6,658	2168	10.007	36,345	11,085	4,744	71,007
March	6,572	2145	9.925	36,309	11,029	4,707	70,687
April	6,487	2123	9.845	36,272	10,973	4,671	70,371
May	6,402	2101	9.763	36,235	10,917	4,635	70,053
June	6,316	2079	9.682	36,199	10,861	4,598	69,735
July	6,231	2057	9.600	36,163	10,805	4,562	69,418
August	6,146	2035	9.519	36,126	10,749	4,525	69,100
September	6.060	2012	9.438	36,090	10,693	4,489	68,782
October	5.975	1990	9.356	36,017	10,637	4,453	68,428
November	5.890	1968	9.275	35,980	10581	4,416	68,300
December	5.854	1.956	9.263	35,974	10,570	4,400	68,017

Source (Preparation of the researchers based on reduction rates)

**Secondly. Green Target Cost:** When the desires and requirements of customers are identified, it will contribute significantly to achieving customer satisfaction and fulfilling their desires, and thus it will be an incentive for the customer to choose the cement product for the Kufa Cement Factory exclusively, and when interviewing many customers and after collecting information about the types of competing cement in the markets where the requirements are. Available, it is possible to determine the target sale price in the following table:

**Table (3) Prices for the sale of cement products competing with the factory product for the year 2021**

NO	Competitor product name for resistant cement	Selling price per ton
1	Muthanna Cement	84000
2	Babylon cement	83000
3	Krista cemented	82000
4	North Cement	83000
5	Lion cement	81000
6	Karbala Cement	82000
7	Cement Car	83000
<b>Total</b>		<b>578000</b>

Source: Prepared by the researchers based on the information of the marketing department

In light of the information available to us, the target selling price will be reflected in the average prices of competing products. The target selling price per ton of resistant cement will be 82571 dinars per ton ( $578000 \div 7$ ). These prices were determined after studying and reviewing the market prices of competitors' products. By communicating with the marketing department at the company's headquarters. The average price was taken as it represents the most accurate target price and eliminates the problems of price fluctuation.

**Target Selling Price =  $578000 \div 7 = 82571$**

**Second: Determining the target profit:** Companies determine the profit margin by calculating a certain percentage ranging between (15%-20%) of the target selling price, and because the competition is intense between the cement product, (15%) has been chosen as an acceptable profit margin from the target selling price.

**Third: Determining the target cost:** To determine the target cost, the desired profit margin is subtracted from the target selling price as in the following equation.

$$\begin{aligned}
 \text{Target cost} &= \text{target selling price} - \text{target profit margin} \\
 \text{Target cost of resistant cement} &= 82571 (82571 \times 15\%) \\
 &= 82571 - 12386 \\
 &= 70185 \text{ dinars per ton}
 \end{aligned}$$

**Fourth: Setting the Green Target Price:** Kufa Cement Factory seeks to provide a green product (environmentally friendly) that aims to achieve a competitive advantage by adding environmental characteristics and according to the requirements of international environmental standards in accordance with the standard





specifications (ISO 9001) and (ISO 14001) and thus customers must pay the green price premium added to the traditional target price to achieve environmental characteristics when using the product, so the green product premium is symbolic to constitute 5% of the cost per ton according to the opinions of engineers, and thus the green target price is (73694) dinars.

**Desired Green Profit Margin Percentage = (Normal Profit Margin × Additional Percentage to Support Environmental Characteristics) + (Normal Profit Margin)**

**Desired Green Profit Rate = (10% × 50%) + (10%) = 15%**

**Green Profit Margin = (73694) × (15%) = (11054)**

**Sixth: Determine the green target cost.** At this stage, the green target cost is determined, based on the green target price, which was determined based on the target price of traditional competitors' products as follows:

$$\begin{aligned} \text{Green Target Cost} &= \text{Green Target Price} - \text{Green Target Profit Margin} \\ &= (73694) - (11054) \\ &= 62640 \text{ Dinars Per Ton} \end{aligned}$$

**Seventhly. Determine the cost gap:** To determine the gap, it is done by comparing the current cost calculated according to the technique of balancing sustainable continuous improvement of the resistant cement product of (68,126) dinars per ton with the green target costs of the resistant cement product of (62640) dinars per ton, and therefore the current cost is greater than the green target cost of resistant cement to be the target reduction of the product (5486) dinars per ton, and therefore there is a need to conduct the target reduction process through the use of one of the verification tools for the target cost, which is engineering Value

**Viii. Using value engineering to work on target reduction:** In this step, we will study the stage of furnaces in determining the target reduction in the economic unit, which is done through value engineering

**Table (4) The cost of one ton of cement for the furnace stage for the year 2021**

Stage	Total amount	Clinker cost	Cement grinding cost	The cost of one ton of resistant cement
	(100%)	(90%)	(10%)	
Ovens	2,208,686,912	32349.6	3594.4	35944

Source: Preparation of the researcher based on laboratory data

To exclude substances that do not add value to the production process, we exclude black oil involved in the production process and use natural gas as an alternative, as black oil leaves toxic substances that affect the environment and human health, in addition to reducing the consumption of natural resources and preserving them for future generations.

#### **A. Using Natural Gas as an Alternative to Black Oil**

The process of converting cement production in the furnace stage to work with cleaner energy, such as natural gas as an alternative to black oil, and when using natural gas, it has economic and environmental benefits that seek to reduce costs in addition to reducing harmful emissions in the environment and working to improve environmental sustainability, in the Kufa cement plant, resistant cement is produced in which black oil is produced in order to generate thermal energy to burn putty in rotary furnaces, Where black oil was the source of harmful emissions at this stage and high prices, compared to natural gas, and to preserve it from waste as it is a depletable natural resource, where black oil was replaced by natural gas in the stage of rotary furnaces, the production of each ton of clinker needs (180 liters) of black oil, equivalent to (174.924 kg of black oil) and its calorific value is (10417 kcal / kg), While the calorific value of the gas is (10060 kcal/m<sup>3</sup>), therefore, when producing one ton of clinker, we will need the following amount of gas:

**Table (5) Determining the costs of a ton of clinker of black oil and gas in the furnace phase for the year 2021**

Month	Amount of black oil / liter	Price of a liter of black oil	Cost of black oil	Amount of natural gas m <sup>3</sup>	price m <sup>3</sup>	Cost of natural gas	Amount of clinker produced	Cost per ton
January	6271600	105.421	661158344	6342814	50	317140700	61448	15921
February	6072600	105.924	643234082	6146764	50	307338200	62563	15194
March	6212990	105.380	654724886	6213000	50	310650000	62815	15369
April	5559065	104.959	583473903	5560000	50	278000000	56807	15165
May	6173660	117.392	724738236	6174000	50	308700000	66030	15651
June	4027058	210.302	846898246	4824811	50	241240550	45580	23873
July	3720830	180.019	669820096	2561930	50	314138000	50254	19580
August	2438667	163.013	397534424	3069764	50	275421550	41069	16386
September	3336284	163.388	545108770	3227712	50	161385600	53827	13125
October	2729870	163.532	446421101	1064162	50	189701600	35620	17859
November	2294771	163.533	375270704	4711177	50	235558850	40256	15174
December	2506670	201.463	505001157	5510147	50	400840850	56488	16036

Source: Prepared by the researcher based on the data of the cement plant.

When excluding black oil and replacing it with natural gas, the cost of one ton of clinker is as in Table(6).

**Table (6) Determining the costs of a ton of clinker of natural gas in the furnace phase for the year 2021**

Month	The quantity of gas replaced instead of black oil / liter	Price per liter of natural gas	Cost of natural gas	quantity of natural gas m <sup>3</sup>	price m <sup>3</sup>	Cost of natural gas	The quantity of clinker produced	Cost per ton
January	7086908	50	354345400	6342814	50	317140700	61448	10928
February	6862038	50	343101900	6146764	50	307338200	62563	10397
March	7020679	50	351033935	6213000	50	310650000	62815	10533
April	6281743	50	314087173	5560000	50	278000000	56807	10423
May	6976236	50	348811790	6174000	50	308700000	66030	9958
June	4550576	50	227528777	4824811	50	241240550	45580	10285
July	4204538	50	210226895	2561930	50	314138000	50254	10434
August	2755694	50	137784686	3069764	50	275421550	41069	10061
September	3770001	50	188500046	3227712	50	161385600	53827	6500
October	3084753	50	154237655	1064162	50	189701600	35620	9656
November	2593091	50	129654562	4711177	50	235558850	40256	9072
December	2832537	50	141626855	5510147	50	400840850	56488	9603

Source: The researchers prepared based on the data of the cement plant.

We note from the table that the cost of one ton of clinker has decreased significantly when excluding black oil with natural gas, as shown in Table (7) Cost reduction after replacing black oil with natural gas for the furnace stage for the year 2021

**Table (7) Cost Reduction After Replacing Black Oil with Natural Gas for the Furnace Phase for the Year 2021**

Month	The amount of oil used with natural gas	Cost black oil with natural gas	The amount of natural gas m3	The cost of natural gas	The amount of clinker produced	The cost of a ton of oil and gas produced	The cost of a ton produced with natural gas	Difference
January	12614414	978299044	13429722	671486100	61448	15921	10928	4993
February	12189364	950572282	13008802	650440100	62563	15194	10397	4797
March	12425990	965374886	13233679	661683935	62815	15369	10533	4836
April	11119065	861473903	11841743	592087173	56807	15165	10423	4742
May	12347660	1033438236	13150236	657511790	66030	15651	9958	5693
June	8851869	1088138796	9375387	468769327	45580	16873	10285	6588
July	6282760	983958096	6766468	524364895	50254	16580	10434	6146
August	5508431	672955974	5825458	413206236	41069	16386	10061	6325
September	6563996	706494370	6997713	349885646	53827	13125	6500	6625
October	3794032	636122701	4148915	343939255	35620	15859	9656	6203
November	7005948	610829554	7304268	365213412	40256	15174	9072	6102
December	8016817	905842007	8342684	542467705	56488	16036	9603	6433

Source: Researcher numbers based on tables (6) and (7).

The rate of reduction during the year when adding the months by difference and dividing it by the number of months is the reduction (5790) per ton in the furnace stage after excluding black oil and replacing it with natural gas, and when excluding the amount from the furnace stage, the cost of this stage is (30154) dinars per ton, and on the other hand, we note that the actual adjusted cost of (62084) per ton is less or close to the green target cost of (62640) dinars per ton.

#### IV. CONCLUSIONS

1. The green target cost is one of the important techniques that control the product in its initial stages and before starting the production process to provide an opportunity for the economic unit to switch from traditional products to green products to achieve a competitive advantage for the unit.
2. The trend towards consuming green products globally is one of the main motives for directing modern cost technologies with attention to environmental issues.
3. For the success of balancing sustainable continuous improvement in the economic unit, support from senior management and employees is required.
4. The economic unit that applies the sustainable continuous improvement technique is not compatible with the traditional operational budgets because the sustainable continuous improvement technique seeks to bring about improvements in the production process and the traditional budgeting system is fixed, it does not take into account these improvements.
5. The use of the green target cost and the sustainable continuous improvement budget makes the economic unit able to provide appropriate information for the process of improvement and cost reduction for products.

#### V. RECOMMENDATIONS

1. Encouraging economic units to develop cost and administrative accounting systems in order to adapt to the environmental changes surrounding the economic unit and to strengthen these systems to supply financial and non-financial information to provide assistance to management in order to make sound decisions and preserve natural resources from depletion.
2. When applying the sustainable continuous improvement budget, the economic unit must adjust the traditional operational budgets to suit the changes that result from improvements in the work corridors that drive the unit to apply the sustainable continuous improvement budget.
3. Work to spread the culture of balancing the continuous and sustainable improvement through the establishment of educational courses and the publication of research and studies related to this technology.
4. Working to support workers through material and moral incentives and linking the worker's wages to the productivity of each worker.



5. The economic unit is based on continuous search for continuous improvement in order to reduce production costs and market the product.
6. The factory management should provide the appropriate capabilities to implement the sustainable continuous improvement balancing technique.

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