World Economics & Finance Bulletin (WEFB)
Available Online at: https://www.scholarexpress.net
Vol. 27, October, 2023
ISSN: 2749-3628,

THE ROLE OF GREEN TARGET COSTING TECHNOLOGY AND THE PRODUCT LIFE CYCLE IN REDUCING COSTS

Ass Pro Dr Mohammad Abdul Wahid Fllayih[1]
[1]Iraqi University - College of Administration and Economics
Mohammad Abdul Wahid Fllayih,
Iraqi University - College of Administration and Economics
Email: mohammed.hilf@aliraqia.edu.iq

Article history:

Received: 14th August 2023
Accepted: 11th September 2023
Published: 16th October 2023

Abstract:

The research aims to explain the theoretical framework for the research variables represented by green target cost technology, the product life cycle, and cost reduction, and to study the relationship between these variables and how to apply them in the research sample. This is done by relying on the deductive approach in presenting the theoretical side and the inductive approach in presenting the applied side in the General Company for Plant Industries. The research reached a set of conclusions, the most important of which is that traditional methods are unable to meet the desires of customers and keep pace with developments in the business environment. In addition, the green target costing technique and the product life cycle are contemporary techniques that contribute significantly to helping economic units grow and continue and achieve one of the most important dimensions. The competitive advantage of reducing costs.

Keywords: Greentarget cost,Productlife cycle,Cost reduction

1. INTRODUCTION

Most economic units suffer from high production costs compared to competing products. They also suffer from the amount of pollution that accompanies the production process, which in turn reflects negatively on the performance of the economic units in general and the research sample in particular, which makes the findings unable to keep pace with development.

We seek to propose a set of raw materials that are an alternative to used materials and that contribute to reducing pollution and reducing costs, and this is what the research contributes to achieving by explaining the theoretical framework of the research and application variables in the research sample to reduce costs.

Al-Mousawi's study showed how to determine green target costs by determining the price and price premium, as well as Al-Obaidi's study's reference to how to determine the size of the cost to be reached. My study highlights an important variable represented by the life cycle of the product that achieves the desired benefit by reducing the volume of pollution and reducing production costs to achieve Objectives of economic unity

1.1 Research Methodology

The research methodology is the basis that contributes to identifying the problem, importance and objectives of the research, which helps to present the most important paragraphs related to the research as follows

1.2 Research problem

The research problem represents the challenges facing economic units in overcoming environmental problems and the resulting increase in product costs and the increase in pollution occurring, which negatively affects the lives of living organisms. In addition, economic units rely on pricing their products using traditional methods that have become unusable. Able to keep pace with developments in competing unit .

1.3 Research objectives

The research seeks to achieve the following objectives

1-Explaining the cognitive foundations of green target cost technology, the product life cycle, and cost reduction

2-Study and analyze how to reduce costs based on green target cost technology and the product life cycle

3-Applying the green target costing technique and the product life cycle in the research sample company and explaining how to reduce costs

1.4 The importance of research

The importance of research is evident in the adoption of contemporary technologies, including green target cost technology and the product life cycle, which contribute to adding value to the economic unit through the strengths and opportunities achieved by these technologies and their impact on reducing costs, which in turn makes the economic units able to Competition and achieving short and long-term goals.

1.5 Research hypothesis

World Economics & Finance Bulletin (WEFB)
Available Online at: https://www.scholarexpress.net
Vol. 27, October, 2023
ISSN: 2749-3628,

The research is based on the main hypothesis that (the green target cost and the product life cycle contribute to reducing product costs)

1.6 Sources of data collection

1.6.1 The theoretical aspect of research

The researcher relied on books, letters, dissertations, Arab and foreign research, and published and unpublished periodicals to cover the theoretical aspects

1.6.2 The practical side of research

The researcher relied on cost data, reports, and financial data from the refinery, the research sample, through field visits and personal interviews to cover the practical aspect of the research.

2. RESEARCH METHODOLOGY

The researcher adopted the deductive approach in covering the paragraphs of the theoretical side. As for what is related to the practical side, the researcher relied on the inductive approach and the approach to analyzing the data obtained from the research sample company.

2.1 Limitations of research

2.1.1. Spatial boundaries

The researcher chose the General Company for Plant Industries as a sample to carry out the research due to the diversity of its products and the customers' need for them, the costs of which will be calculated from its records to arrive at the cost of a liter.

2.1.2. Time limits

The researcher approved the financial statements for the year 2022 at the end of the fiscal year to complete them and apply contemporary techniques to them to achieve the desired results

2.2 The concept of target cost

The concept of target costing has received great attention in the literature on cost management when developing new products. In the target costing method, activities are controlled in light of objectives or in light of the cost allowed in the market list that should be achieved if the economic unit is to be in a profitable position. Under this, the required profit margin is subtracted from the estimated selling price to determine the target cost of the new product. All members of the economic unit work to design and manufacture the product at the target cost. It also indicates that the target costing method helps economic units estimate costs accurately, reduce the risk of insufficient profits, and develop better and faster products. It also aims to estimate costs based on the goal pursued by the economic unit in a competitive environment. Hence, target costing is defined as a cost management technique to minimize the total cost of a product throughout its entire life cycle with the help of production, engineering, R&D, marketing and accounting departments. **(**Almusawi and Alani ,2022) Most research indicates that the origin of target costing is in the 1930s in a company The German Volkswagen company, as well as the English Marks Spencer company, but its application and development took place in Japan by the automobile manufacturer Toyota in 1961. Research and articles on the target costing technique developed gradually, especially in the 1980s in Japan, and the target costing technique became used as an input for cost management. And price allocation in the late eighties, due to the loss of a large portion of the market share of most companies The American and Japanese company Toyota applied this technology with the aim of ensuring that it provides products characterized by high quality and the lowest prices to achieve an acceptable level of profits. As a result, the application of the targeted costing technique spread in many Japanese companies, as the application rate reached approximately 21% at the beginning of 1991. Japanese studies referred to this technique as (Genka Kikaku) and then it was translated into English to be known as target costing, which is the prominent term at the present time in all accounting literature.(Almuhana , 2020)

There are a group of factors that contributed to the emergence of the target cost, which can be summarized in four basic factors: (Alrakabi, 2009)

First: The intense competitive environment and the internal and external challenges facing economic units, due to the changes that have occurred This has happened in the world and the ease of moving products from one country to another, in addition to the browsing and information provided by the Internet service On the types of international products and purchasing through this service, in addition to the many types of products with specifications Multiple and different global origins, which led to the emergence of effective factors in the production process, represented by the customer value chain. And the equipped one. And its failure to respond to the challenges of the traditional cost system.

Second: The clear shortcomings of the traditional cost system Non Technology The era and the intense competitive environment imposed by nano technology And the development of communications and production technology. The most important shortcomings are as follows

A - The traditional cost system focuses on the cost of the product, given that the cost is what drives the selling price when added A certain profit margin is added to the cost to determine the selling price, while the philosophy of the target costing technique focuses on... Selling price is what drives costs, and therefore customer requirements are essential.

B - When reducing product unit costs, the focus is on the production stage of the product life cycle Reducing loss and damage in the industrial process, while the targeted cost looks at all stages The product life cycle, especially the design stage, where costs are controlled

World Economics & Finance Bulletin (WEFB)
Available Online at: https://www.scholarexpress.net
Vol. 27, October, 2023
ISSN: 2749-3628,

in advance before production begins. And the supplier in Costumer Value

Third: In traditional cost systems, the customer value chain is not looked at Value of the production process while the target cost is carefully considered as part of the value chain system It directly affects the competitive position of the economic unit. System

Fourth: There is a fundamental difference between the traditional costing system and the target costing technique, and this difference is due to: The difference is in the basis upon which each of them is built, and thus a difference in the results and method

2.3 Green product concept

Although green products are becoming increasingly widespread, many controversies surround their acceptance in the market. The main problem seems to be related to the very definition of the concept of green products. There is no clear definition and specific concept, and the literature still lacks a generally accepted definition. What is a green product? This article compares the definition of green product within three different perspectives (academic, industry, and consumers) based on a descriptive meta-analysis, a bibliographic approach, and a consumer survey (Fabien, Boivin and Julien, 2019) Green products are often referred to as products that are recyclable and reusable. For example, these products are paper, aluminum cans, glass, etc. However, some professional researchers have come up with a more specific and specific description of green products. Some of them have defined green products as products that are biodegradable, non-toxic and packed with recyclable materials. In addition, they also believe that as a green product, it should be environmentally friendly which means that the products should have the least harmful impacts and effects on the environment and human health. Although Hence, green products should generally be those that are easily dissolved or decomposed in soil, air and water to conditions that will be accepted by the public. Therefore, it can be said that green products can be interpreted in many different ways depending on a person's personal perception. Although most explanations are fairly similar, there is no consistent definition.(Mun and Yazdanifard, 2013)

2.4 The concept of green target cost

Many economic units are looking for effective ways and methods to reduce the costs of green products, which have the main dimensions of reducing energy consumption, reducing the depletion of natural resources, reducing pollution and using renewable (alternative) energy while maintaining product quality and customer satisfaction in order to achieve the advantage. Competitiveness. Green target costing is one of the techniques that helps provide environmentally friendly products and achieve competitive advantage.

It is defined as a technology that represents an evolution of traditional target costing technology that takes into account environmental aspects by reducing harmful waste and toxic emissions such as carbon dioxide gas, striving to achieve the target cost of the product and taking into account environmental impacts according to a comprehensive vision. An approach to product design in which costs and environmental impacts are identified, help meet customer needs and wants, fulfillment of environmental requirements, and consideration of cost constraints are combined to create a green product design. Through the above, researchers can define green target costing technology as a technology that works to determine costs and reallocate them according to the green value provided to customers, which leads to reducing production costs and achieving sustainability. (Almusawi and Alani ,2022)

Target costing is known as one of the cost management methods that works to reduce the cost of the product in the early stages (research, development and design stage). Target costing is one of the management accounting activities that aims to reduce the initial costs of products or services without reducing their quality and specifications through studying, analyzing and evaluating all procedures that will reduce the cost of their research, development and design processes. There are six main principles of target costing, which include: Determine cost according to price, focus on customers, focus on product design, participate in the value chain and reduce cost during the entire product life cycle. Target costing aims to reduce the total cost of new products, thus achieving the desired level of profits and quality levels, which contributes to gaining customer satisfaction. and meet their needs. On the other hand, target costing motivates employees to innovate and create during the product design and development processes to reduce their costs (Alobaidy, 2022)

It seeks to provide green products that are compatible with environmental requirements because many consumers do not have sufficient knowledge of the requirements, in addition to the lack of environmental standards or laws in many industries, and most of the time the term "green" is misinterpreted. Or "environmentally friendly" is wrong or not understood by most consumers or manufacturers. In the same context, companies and economic units work to implement the functions of green products that are desired from the customers' point of view on a pull or push basis. Where "pull" means implementation as per the customer's request, while "pull" means knowing the

World Economics & Finance Bulletin (WEFB)
Available Online at: https://www.scholarexpress.net
Vol. 27, October, 2023
ISSN: 2749-3628,

features of the green product created by the company, and that both push and pull increase the customer's perceived value (Mahmoud and Jassim , 2009)

2.5 Steps of green target costing

There are a set of steps to the green target costing technique (Alobaidy,2022) (Mahmoud and Jassim , 2009)

1.Identification and valuation of desired green specifications and functionality

In the first stage, the desired specifications and characteristics of the green product (quality and functionality) are determined from the customer's perspective. Most customers are not aware of the environmental requirements of green products, and the concept of green products is not clear enough for many of them.

2.Evaluation of target selling price and of green price premium

The second step is to evaluate the target selling price and green price premium by analyzing competitive market conditions and customer feedback. Some studies indicate that customers are willing to pay the cost of green specifications;

3.Adjustment of green profit margin and calculation of allowable costs

Allowable costs are calculated by deducting the profit margin from the target price. When calculating the allowable costs for green products, the profit margin must be adjusted because the high risks associated with this type of product include, a high lack of experience with green products, a lower probability of success than optical products, and their design process is complex and requires a large amount of information

4.Cost breakdown on green cost drivers

The permissible costs for the product are then determined, as all components of the product are determined to be determined, which helps enhance customers' awareness of the value of green product specifications

5.Execution of green cost management measures

Under this step, the standard costs of the green product components are determined, taking into account making the products compatible with environmental requirements (greening the product), and then the standard cost and the allowable cost for each component are compared through the value control chart.

6.Green kaizen costing

The continuous improvement process is an extension of traditional Kaizen, which is not only a way to reduce costs, but also gives environmental issues great importance

2.6 The concept of the product life cycle

Levitt's classic theory of the product life cycle The starting point was to consider the nature of the product's life and its implications for marketing. In presenting this theory, common critics in the marketing literature are emphasized Noting the possibility of benefiting from the theory in the real world of marketing. In light of this, there is Another concept of product life was also introduced - INCIs, GARC, and Brill (expansion theory). Product Life Cycle), Telles and Crawford (evolutionary approach to product growth theory) and Vernon's theory of the international product life cycle (Kozłowski,2011) What is Product and Product Life? Basically, a product is the object of the exchangeprocess, the thing which the producer or supplier offersat a potential customer in exchange for somethingwhich the supplier thinks as equivalent or of greatervalue. The product is an important component of themarketing mix. A product is anything that can beoffered to a market to satisfy a want or need. It includesgoods, services, experiences, events, persons, place,properties, organizations, information and ideas. Product Life- The definition of product life is context dependent as well as user-dependent, E.g., for a customer the product life is the period of time that she/he uses it(e.g. from purchasing until it is disposed of). In contrast to this, the product life is normally longer for the producing compony; it starts with the ideas of a product and concludes with the end of the production with the end of the service period for the produc The product life cycle is the period of time over which an item is developed, brought to market and eventually removed from the market. It is an important tool for analysis and planning of the marketing mix activity. According to Wells et al product life cycle is based on a metaphor that treats products as people and assumes they are born (introduction) ,develop (grow), age (mature), and die (decline). To Morden (1991:240), the product life cycle represents recognition of the fact that most products will only have a finite market life beit short as in the case of fashion goods or long as in the case of certain type of industrial equipment. (Kamthe, and Singh Verma,2013)

The product life cycle from the market perspective is defined as the sequence of product life stages in Markets, which begin with introducing the product to the markets, then the growth stage in sales, and finally the maturity stage Decay and withdrawal of the product from the market. From the customer's point of view, the product life cycle is defined as the period that the product passes through, starting from the purchase stage, then the operation stage, followed by the support and services stage, and finally the product disposal stage (Almuhana , 2020)

(Hansen & Mowen, 2006:503-504) believe that the above three points of view

The product life cycle contributes to generating important ideas for producers who cannot ignore viewpoints

World Economics & Finance Bulletin (WEFB)
Available Online at: https://www.scholarexpress.net
Vol. 27, October, 2023
ISSN: 2749-3628,

There is a relationship between the three points of view, which are as follows:
1- Since the market point of view is based on the nature of the sales pattern during the product's life cycle, and its goal is based on profits,
2.The production point of view emphasizes important internal activities such as research, development, production, marketing, and after-sales services for the product, provided that the production stages are found to support the sales goal in the marketing stage and this requires resources and costs. Therefore, this point of view is described as a point of view based on cost basis,
3 - From the customer's point of view, it is based on the level of product efficiency based on the price paid, which is represented by the acquisition cost that includes the purchase price as well as post-purchase costs such as operating costs, maintenance, and product disposal costs, provided that profits and costs are linked to the product's efficiency and price. The desires and needs of customers and the services that will be provided to them must also be a goal that producers seek, because customer satisfaction is affected by the benefit he obtains on the basis of the price he pays
It requires supporting the product life cycle by moving from product data exchange to product information exchange, across different disciplines and domains. There are a set of standards relevant to supporting lifecycle management (Subrahmanian,et,al,2006)
(1) According to the stages of the product life cycle, the standards address:
(a) Product development standards;
(b) standards for production of products;
(c) standards for use of the product; and
(d) product identification standards associated with product life cycle tracking
(2) According to the scope of standards:
(a) PLM best practices and business specifications;
(b) standards related to specific applications;
(c) standardized data models for representing product data; and
(d) industry standards

The following figure shows the product life cycle

Figure 1. Product Life Cycle

Source : S. Kroták, M. Šimlová and C. Štádler **, 2014 ,** DIFFERENT VIEWS ON THE PRODUCT LIFE CYCLE

2.7 Stages of the product life cycle

The product goes through the following stages: (Blocher .et al., 2010:566)
1. Product introduction stage: Under this stage, competition is limited, which leads to a decrease in sales as a result of the decrease in demand for the product, until customers know it and determine its compatibility by knowing their desires.
2 - Growth stage: This is the stage in which the spread of the product increases in the market, accompanied by an increase in the percentage
Sales in the event that the product excels in meeting the needs and requirements of customers, in addition to increasing the intensity of competition
At this stage, the price begins to decline.

World Economics & Finance Bulletin (WEFB)
Available Online at: https://www.scholarexpress.net
Vol. 27, October, 2023
ISSN: 2749-3628,

3. Maturity stage: At this stage, the competitive image is determined, and the product may have a fixed share with
Continued increase in sales, but at lower rates, and reliance on cost and quality in competition.
4. The stage of decline and decay: This stage marks the beginning of a decline in the product's market share as a result of the change in consumer tastes and the intensity of competition. The product may be replaced by new products, which leads to a decrease in sales and may reach zero or settle at the lowest level with a decrease in customers. The product and gradually if no action is taken regarding it

2.8 Reducing costs based on the green target cost and the product life cycle

There is a consistent set of tools related to cost planning, cost management, and cost control. This method aims to reduce costs by knowing the different stages of the product cycle, analyzing the costs of each stage and improving technologies and manufacturing processes. Managers of economic organizations use the target costing method to determine with certainty the maximum cost of their new products and set the target The price of the product in order to obtain a higher profit. The target costing method is not only a method of calculating costs but it is also a modern management method that uses techniques evaluated in relation to the market Study and analyze the value and reduction of diversity, manufacturing technology and the relationship with suppliers and customers. Target cost is the estimated production cost, which is calculated based on expectations of a competitive selling price and expected profit margin. It has values between the permissible cost, which is determined by the market according to competition, and the estimated cost, which is determined according to the existing means of production and techniques used by the organization. (vasil and croitoru ,2018)
Product profit margins are typically judged on a period-by-period basis without compensation of the product life cycle. However, products, like people, have life cycles. the product The life cycle is a model that depicts the stages that a product category (not every product) goes through. It passes from the time the idea is conceived until production stops. those stages They are development (which includes design), introduction, growth, maturity, and decline. The traditional sales trend line as a product category passes through each stage of the life cycle. Companies need to be aware of where products are in their life cycle Because, in addition to the sales impacts, the life cycle stage can be enormous Impact on costs and profits. In the design phase, production methods, materials and conversion processes are determined specified. Many quality, cost and environmental impacts are identified with decisions specified at this stage. During the product introduction phase, costs can be significant, Although technology and competition have tremendously shortened the time spent
in the development stage, effective development efforts are critical to a product's life cycle profitability. Decisions made during this stage can
• reduce production and life cycle costs through material specifications,
• shorten manufacturing time through process design,
• increase quality by minimizing potential design defects, and
• add flexibility.
Manufacturers are acutely aware of the need to focus attention on the product development stage, and the performance measure of time to market is becoming more critical. After a product is designed, the producing firm has traditionally determined product cost and set a selling price based, to some extent, on that cost. If the market will not bear the resulting selling price (possibly because competitors' prices are lower), the firm either earns less profit than desired or attempts to lower production costs. Because of intensified
competition and surplus production capacity in many product markets, companies often have less discretion in setting prices now than in the past. Today, most products are designed to be sold at a particular price point that is associated with the preferences of a particular product market segment. To keep production costs in line with the price point, some companies (especially Japanese ones) use a technique called target costing. As expressed in the following formula, target costing develops an "allowable" product cost by analyzing market research to estimate what the market will pay (price point) for a product with specific characteristics. (Kinney and Raiborn, 2011)

THE PRACTICAL SIDE

3.1 An introductory overview of the research sample company

In 1953, a group of international companies began building the Doura Refinery, which is one of the formations of the Ministry of Oil. It began work in 1956 with an area of approximately 260 hectares and was called the Doura Refinery due to its proximity to the Tigris River. It was established in this place because of the availability of a large area and the availability of water that the refinery needs in its work for cooling, boilers, and drinking water The refinery was developed in its field of work, area, and the products that it produces. The refinery contains multiple products, and after reviewing the available reports and the technological path for each of these products, the ready-made oil product was chosen because it has an important characteristic that helps the researcher to

World Economics & Finance Bulletin (WEFB)
Available Online at: https://www.scholarexpress.net
Vol. 27, October, 2023
ISSN: 2749-3628,

complete his research, due to the size of the product's competition. With the products of private companies.

3.2 Calculating the costs of the finished oil product based on the company's records

The finished oil product consists of a group of direct costs, including materials and wages, and indirect industrial costs with their various components and administrative ones for the refinery. As for the marketing costs, there is a company specializing in marketing petroleum products. Below is the table for the product costs: -

Table 1. Finished oil product costs for the year 2022

S	Cost items	Total costs
1	Direct materials	8,259,979,064
2	Direct wages	440,097,908
3	Indirect industrial costs	499,509,434
4	Administrative costs	73,234,514
5	Total total costs	9,272,820,940
6	Quantity produced during the year (liters)	2,218,378
7	The cost of one liter	4180 dinars/litre

Source: Prepared by the researcher based on the financial department's data

It is clear from the table above that the costs of a liter of finished oil amounted to (4180) dinars, which includes the costs of the above cost elements in addition to the environmental costs borne by the refinery due to the fines imposed on it by the competent authorities, which do not represent the reality of the environmental impact caused by the refinery, but rather are determined by the concerned authority. Which amounted to (140,030,000) dinars, which was doubled due to the refinery's delay in paying it and then imposed another fine of (7,240,000) dinars. This is added to the costs mentioned in the table above (147,270,000) dinars (140,030,000) + 7,240,000 dinars. Thus, the cost of environmental pollution is added to the cost of one liter. The amount is (66.38) dinars through (147,270,000 ÷ 2,218,378). Thus, the cost of one liter is (4246.38) dinars / liter.

3.3 Applying the green target costing technique in the research sample company

1- Determine the target price and the green price premium

The green target cost technique is reduced after determining the target price for the research sample product through studying the market and reviewing the products of many competing companies in the Iraqi markets. During the field visits, it became clear to the researcher that there are different products whose prices range from (4000 dinars - 6000 dinars) per liter, which are widely popular. Accordingly, the researcher set the target price (3500) dinars / liter, which is considered a competitive price in front of the refinery. Either the green price premium is determined by determining the size of the changes in the production process, and the price premium is estimated at (200) dinars, and thus the target price is (3700) dinars / liter.

2- Determine the target profit margin

The company, the research sample, through personal interviews and the planning, research and development departments, and through reviewing its annual plans, wants the profit percentage for most of its products to be a percentage ranging from (10% - 15%) of the selling price, and a percentage of ((10%) has been set as a minimum, as the margin is Profit (370) dinars / liter (3700 * 10%).

3- Determine the green target cost

The green target cost is determined by the following equation.

Green target cost = green target price – green profit margin

= 3700 - 370 = 3330 dinars

The difference between the current cost and the target cost is as follows.

The gap = 4246.38 – 3330 = 916.38 dinars

To reach the green target cost, product life cycle technology will be applied and the (Simapro9) program will be adopted, which works to determine the amount of pollution and emission occurring that accompanies the production process and the costs of this emission.

3.4 Applying product life cycle technology (Simapro9 program in the Dora refinery)

The program is implemented through the following steps:

1- Determine the goal and scope

2-Data analysis

3-Environmental impact assessment

4-Interpretation

-Steps for applying the Simapro9 program for life cycle assessment (LCA)

1- Determine the goal and scope:

A- Setting the goal: The goal of using the program is to determine the size of pollutants from the stage of starting production to the stage of finishing manufacturing and determining the effects that accompany the production process and the extent to which they can be treated.

B- Determine the area: fat units in the Daura refinery.

2- Data analysis: The data necessary to implement the program was determined through repeated field visits and personal interviews, as the amount of emissions that accompany the production process was known, which will be analyzed through the special program, and this is shown in Table (2).

3- Evaluating the environmental impacts and damages of the finished oil product

The results of applying the (Simapro9) program to determine the environmental impacts of the finished oil product showed that there are (15) impact categories

World Economics & Finance Bulletin (WEFB)
Available Online at: https://www.scholarexpress.net
Vol. 27, October, 2023
ISSN: 2749-3628,

according to the characterization index, as shown in the table below.

Table 2. Impact categories for finished oil product

S	Impact categories	Unit of measurement/hour	Quantity
1	Carcinogenic substances	Kg	33.308822
2	Non-carcinogenic substances	Kg	11.11298
3	Inorganic substances affecting the respiratory system	Kg	22.21441
4	Ionizing radiation	Bq	24. 86
5	Ozone layer depletion	Kg	79.2
6	Organic substances affecting the respiratory system	Kg	44.0913
7	Water toxicity	Kg	177.1
8	Soil toxicity	Kg	41.8
9	Soil acidification	Kg	0. 242
10	Land desertification	Kg	22.0924

Source: Prepared by the researcher based on the program's outputs

Air pollutants: the number one pollutant
Annual amount of pollutant = amount of pollutant (kg/hour) * number of annual working hours
Amount of pollutant = 33.308822 kg/hour * 1715 hours/year
Amount of pollutant = 57124.6297 kg/year
To convert from kg to tons through the following:

Quantity (in tons) = Quantity (kg) * 0.001
= 57124.6297 kg * 0.001 = 57.12, 57 tons/year

Cost = 57 tons * $6 / ton = $342 to calculate the cost in dinars
= 342 dollars * ()1,300 dinars
Cost = 444,600 dinars/year

By applying the above equations to the remaining types of pollutants, the total costs of pollutants are obtained. Accordingly, the total costs of environmental pollutants that were calculated based on the program's outputs are shown in the following table:

Table 3. Costs of pollutants under the (Simapro9) program

S	Impact categories	Cost
1	Carcinogenic substances	444600
2	Non-carcinogenic substances	312000
3	Inorganic substances affecting the respiratory system	312000
4	Ionizing radiation	390000
5	Ozone layer depletion	1092000
6	Organic substances affecting the respiratory system	624000
7	Water toxicity	2340000
8	Soil toxicity	546000
9	Soil acidification	40000
10	Land desertification	312000
	Total cost	**6412600**

Source: Prepared by the researcher based on the outputs of the Simapro9 program

It is clear from the table above that the total costs of pollutants amounted to (6,412,600) dinars/year, and to extract the share of one liter (2.89) dinars (6,412,600 ÷ 2,218,378). Therefore, the cost of a liter is after adding the cost of pollutants to the cost of one liter, and thus the costs of a liter of ready oil amount to (4,249.27).) dinars/liter (4246.38 + 2.89).
Through the field visit and personal interviews with the officials of the production departments in the refinery, the research sample showed that there was a significant increase in the number of workers in the various

World Economics & Finance Bulletin (WEFB)
Available Online at: https://www.scholarexpress.net
Vol. 27, October, 2023
ISSN: 2749-3628,

departments. This increase came due to the continuous recruitment and large numbers that the refinery witnessed in the past few years. The department officials explained that it was possible to reduce the number of workers by (40%). Of the total number of employees, the direct wages are (264,047,944) dinars (440,097,908 * 40%). Through reviewing the technological path of the product, reviewing competing products, and personal interviews with production officials, it was suggested to replace some of the productive scientific inputs and through their application in the (Simapro9) program, and it was completed. Display the quantities that will accompany the production process, as in the table below:

Table 4. Outputs of the (Simapro9) program based on the proposed inputs

S	Impact Categories	Unit of Measure/Hour	Quantity
1	Zinc Dithiophosphate (ZDP)	Kg	0.0121
2	Tricresyl Phosphate (TCP)	Kg	0.2131
3	Vadium	Kg	0.0011
4	SL-Renault RV RXD	Kg	1.1111
5	SL-Renault RV RXD 3	Kg	2.8111
6	MAC EO-M	Kg	0.9008
7	MAC EO-M 2	Kg	1.2282
8	Halocarbons (chlorinated paraffins)	Kg	0.0056
9	Stearic acid	Kg	0.0006
10	Glycerol monooleate	Kg	0.6333

Prepared by the researcher based on the outputs of the (Simapro9) program.

Annual amount of pollutant = amount of pollutant (kg/hour) * number of annual working hours
Amount of pollutant = 0.0121 kg/hour * 1715 hours/year
Amount of pollutant = 20.7515 kg/year To convert from kg to tons through the following:
Quantity (in tons) = Quantity (kg) * 0.001
= 20.7515 kg * 0.001 = 0.0207515 tons
Cost = 0.0207515 tons * $6 / ton = $0.1245 to calculate the cost in dinars
= 0.1245 dollars * 1,300 dinars
Cost = 161.85 dinars/year
From the above equation, all quantities extracted from the above table will be calculated from the outputs of the (Simapro9) program, and the costs of pollutants that accompany the production process and the impact resulting from replacing the inputs of the production process with other inputs will be arrived at

Table 5. Costs of pollutants under the (Simapro9) program proposed inputs

Impact Categories	Cost
Zinc Dithiophosphate (ZDP)	161.85
Tricresyl Phosphate (TCP)	2850.63
Vadium	14.71
SL-Renault RV RXD	14863.18
SL-Renault RV RXD 3	37,604.08
MAC EO-M	12,050.06
MAC EO-M 2	16,429.63
Halocarbons (chlorinated paraffins)	74.91
Stearic acid	8.02
Glycerol monooleate	8471.65
Total cost	92528.72

Source: Prepared by the researcher based on the program outcomes in Table (4)
From what you do and after applying the green target costing and product life cycle techniques, the product costs are shown below as follows:

Table 6. Product costs after applying the green target costing technique and the product life cycle

s	Cost items	Total cost
1	Direct materials	8,259,979,064
2	Direct wages	264,047,944

World Economics & Finance Bulletin (WEFB)
Available Online at: https://www.scholarexpress.net
Vol. 27, October, 2023
ISSN: 2749-3628,

3	Indirect industrial costs	499,509,434
4	Administrative costs	73,234,514
5	Total total costs	9,096,770,956
6	Quantity produced during the year (liters)	2,218,378
7	The cost of one liter	4100دينار/ لتر

Source: Prepared by the researcher

It is clear from the table above that the cost of one liter has decreased from what it was previously, but it has not reached the target cost. The economic unit must exert more effort and search for methods that contribute to reducing environmental costs in particular and product costs in general, which helps the management of the economic unit achieve its goals for the purpose of Growth and competition with other companies, as the product costs, excluding environmental costs, were (4180) dinars, the costs of fines imposed by the concerned authorities were (66.38) dinars, and the share of one liter of environmental pollutants costs according to the outputs of the (Simapro9) program was (2.89) dinars. Thus, the cost of one liter is (4249.27) dinars / liter (4180 + 66.38 + 2.89). After applying the green target costing technique and the product life cycle, the cost of one liter became (4100) dinars, a reduction of (149.27) dinars.

4. CONCLUSIONS

1.Traditional methods are unable to reduce costs and produce products with high-quality specifications, as the costs per liter were **(4180),** and after adding the value of the resulting pollution and other costs, the cost of a liter became **(4246,38 per liter)**
2. The research contributed to determining the volume of pollution associated with the production process, the cost of this pollution, and how to reduce it and reduce its costs, which helps economic units achieve their goals.
3. The research relied on using the Simapro9 program, which helps the research sample unit reduce the costs per liter to become **(4100)** per liter of product
4. The use of contemporary technologies, represented by the green target cost and the product life cycle, contributes to reducing costs by **(149.27)** dinars/liter, which makes the economic unit capable of achieving competition.

5. RECOMMENDATIONS

1-The necessity of adopting contemporary technologies as an alternative to traditional methods that are no longer able to achieve the goals of economic unity
2-The necessity of applying contemporary technologies in the refinery sample of the research because of their clear impact on reducing product costs
3- The necessity of holding awareness sessions for refinery workers to learn the theoretical frameworks of contemporary technologies for the purpose of achieving the goals of the economic unit and for continued growth in its work.

6. FUTURE STUDIES

1.The role of the green target cost and the green product life cycle in achieving the dimensions of sustainability
2.The role of shortening the product life cycle in achieving sustainable competitive advantage
3. The role of value stream maps and the green product life cycle in reducing cost

REFERENCES

1. Almusawi ,Abbas Nawar Khait and Alani Sameer Shakir Mahmood,2022," Using The Green Target Cost To Build A Sustainable Competitive Advantage In Al-zawraa State Company For Electrical And Electronic Industries Production And Assembly Of Solarpanels, *International Journal of Research in Social Sciences & Humanities* , Oct-Dec 2022 Vol. 12, Issue 4; 183-209
2. Vasile**,** Emilia and Croitoru Ion**,** 2018**,** *Target cost – Tool for planning, managing and controlling costs***,** Athenaeum" University of Bucharest, , "Athenaeum" University of Bucharest,
3. S. Kroták, M. Šimlová and C. Štádler , 2014, Different View *product life cycle* , International Design Conference Dubrovnik differ Cycle, Croatia, May 19- 22, 2014.
4. Al-Rikabi, Naji Shayeb, 2010 , The importance the target cost to improve competitive situation for Electronic Industries Company Baghdad
5. Durif, Fabien, Boivin Caroline, and Julien Charles , 2010, "In Search of a Green Product Definition "Innovative Marketing, Fabien Durif, Caroline Boivin and Charles Julien (2010). In Search of a Green Product Definition. Innovative Marketing , 6(1)
6. Alobaidy, Rasha Jasim Ahmed Ebraheem , 2022, The Integration Between Green Target Cost And Value Engineering To Achieve Competitive Advantage, Journal of Positive School Psychology 2022, Vol. 6, No. 5, 3997-4007
7. Subrahmanian Eswaran, Rachuri Sudarsan,

World Economics & Finance Bulletin (WEFB)
Available Online at: https://www.scholarexpress.net
Vol. 27, October, 2023
ISSN: 2749-3628,

Bouras Abdelaziz, . Fenves Steven, Foufou Sebti,and Sriram Ram, 2006, The Role of Standards in Product Lifecycle Management Support, **U.S.** Department Of Commerce *Carlos M. Gutierrez, Secretary* Technology Administration *Michelle O'Neill, Acting Under Secretar15+y of Commerce for Technology* National Institute Of Standards And Technology *William Jeffrey, Director*

8. *Kozłowski* , *Wojciech* ,2011 , **P**roduct life **C**ycle **T**heories **– I**mplications **For M**arketing**,** Olsztyn Economic Journal Abbrev.: Olszt. Econ. J., 2011, 6(2) Chair of Market Analysis and Marketing University of Warmia and Mazury in Olsztyn
9. Kamthe, Milind and Singh Verma, Devendra, 2013. Product Life Cycle And Marketin Management Strategies Department of Mechanical Engineering, Institute of Engineering & Technology, DAVV Indore, International Journal of Engineering Research & Technology (IJERT) Vol. 2 Issue 4, April – 2013 ISSN: 2278-0181
10. Almuhana Qusay Abdul Alayma Aswad , 2020, The Integration of the Target Costing and Time- Driven Product Life Cycle Costing Techniques and it,s effect on Cost Management, Ministry of Higher Education and Scientific Research Karbala University Economic and Administration College Accounting Department
11. Sze Mun, Chu and Yazdanifard , Rashad , 2014, The Review of Green Products in Market, Advantages and Disadvantages. Center for Southern New Hampshire University (SNHU) Program, HELP College of Arts and Technology Kuala Lumpur, Malaysia
12. Mahmoud, Ahmed Hisham and Jassim, Abdul Redha Latif, The Role Of Green Target Cost In Achieving The Environmental Dimension Of Sustainability (Anempirical Study) Research Scholar, Mustansiriya University, Faculty of Administration and Economics, Department of Accounting. Email: Ahmedalkurdi4444@gmail.com
13. Blocher ,Edward J. , Stout ,David E. and Cokins ,Gary ,(2010). "Cost Accounting A Strategic Emphasis "5th Edetion Mc Grow –Hill /Irwin ,New York
14. Hansen, Don and Mowen, Maryanne, 2007, Managerial Accounting Oklahoma State University