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Role of environmental costs in improving the efficiency of the economic unit under the strategy of cleaner production performance

دور التكاليف البيئية في تحسين كفاءة الوحدة الاقتصادية في ظل ستراتيجية الاداء الانتاجي الانظف

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Abstract

This research aims to study and analyze the environmental costs in Kufa Cement Factory, as well as to study the cleaner production strategy technology and to know the extent of its use in reducing environmental costs in Kufa Cement Factory, through the application of the environmental efficiency strategy As one of the most important types of cleaner production strategies, as the problem that he suffers the Kufa Cement Factory is the lack of use of modern accounting techniques, as well as the absence of accounting for the environmental costs caused by its industrial activities, addition the absence of a strategy to be followed by the Kufa Cement Factory in reducing environmental costs .On These environmental costs have bad effects on the environment and society. So the Al-Kufa cement plant was chosen an area of research as it is one of the most polluted industrial establishments, where the researcher reached to reduce environmental costs through the use of the environmental efficiency strategy.

Introduction

As a result of the development that our time witnessed, environmental pollution AL appear, which required the preservation and protection of the environment through holding local and international conferences and agreements, as the science of accounting was not far from environmental issues as the intellectual framework developed and became interested in environmental issues after he was interested in Maximizing profits under the traditional framework, environmental cost accounting has emerged to provide decision-makers and beneficiaries with accounting and environmental information through al measurement and disclosure of environmental costs and obligations in order to give a clear picture of the performance of economic units. The process of determining environmental costs and analyzing them within the economic unit had to be in place. By following a cleaner production strategy to reduce thes environmental costs, The CP technique as a plays an influential role by supporting the advantage or the primacy of the environment, so the management of economic units had to use the CP strategy technique to improve and protect the and its uses and reduce environmental costs.

The first topic / research methodology and previous studies

1.1: First / Research methodology

1.1.1:Research problem

That the inevitable result of the existence of the large environmental costs borne by the economic units that cause environmental pollution has Calculating and measuring environmental costs has become imperativecosts in order to analyze the environmental costs and apply the strategy Cleaner production is inside the Kufa cement plant because of the environmental pollution caused by the cement production process inside the Kufa cement plant, Represented by the effects on the workers in the factory or external pollution that causes the impact on the residential community adjacent to the economic unit, In addition, these environmental pollution, through which the environmental costs are calculated, are exorbitant expenses borne by the economic unit without

achieving economic benefits for the unit if it is used properly to add large sums to the revenues of the economic unit in question.

1.1.2:Research objectives

1) The research aims to identify and study environmental costs and their role in the economic unit.
2) Studying the cleaner production strategy in order to implement it and reduce environmental costs.

1.1.3:Research hypothesis

The research is based on the basic hypothesis as follows:

(**Is there a role for environmental costs in improving the efficiency of the economic unit in the Kufa Cement Plant in light of the cleaner production performance strategy?)**

1.2: Second / previous studies

The study **(Al-Shahmani, 2018)** tagged B**.((A proposed model for accounting for environmental costs according to international accounting standards and its reflection in the outputs of the accounting system))** that draws conclusions, including that environmental costs are not recognized in the financial statements to the difficulty of estimating them as a result of the economic unit in question adopting traditional cost accounting systems In addition to the weakness of the analysis of the elements of environmental costs, their classification and their relationship to the activity cycle used in the Kufa Cement Factory.

The study **(Tayoub, 2016)** tagged with **((Contribution of environmental costs to improving the environmental performance of the industrial establishment))** aims to study the extent of the contribution of environmental costs to improving the environmental performance of economic units, as achieving this goal requires the most important concepts related to the relevant approaches to environmental costs and environmental performance. The study also aimed to demonstrate the ability of the accounting system in the economic unit in question to produce useful information through which it can measure the environmental costs, not their activities, and analyze and control environmental costs.

The study **(Doorasamy, 2016)** tagged b **(dealt with the use of material flow cost accounting (MFCA) to determine the benefits of environmental efficiency and cleaner production in paper and pulp for the manufacturing organization)** The study aimed to identify the obstacles and problems that prevent the implementation of the CP strategy well as demonstrate the expected benefits through Adopting the cleaner production strategy technology compared to the pipe end technology by relying on primary and secondary literature, improving the production process by reducing unwanted environmental impacts and replacing harmful substances with environmentally friendly materials.

The second topic

The theoretical framework for research

2.1 :Definition and importance of environmental costs

The environment is a balanced national wealth from one generation to the next, as the environmental costs are Preparation of metrics to prepare the necessary measures to verify the extent to which the current generation takes into account the conditions of economic efficiency in the field of environment and economic resources. (Omar, 2017: 25) An important step in developing environmental accounting is the development of environmental cost accounting (ECA), as cost accounting is considered as a use of the accounting record to assess the direct costs of products and processes. In this approach, environmental costs are calculated through their specific motives, as environmental cost accounting puts the direct cost on each environmental aspect, and includes environmental measures of pollution prevention and design Environmental and management, as previous methods of environmental impacts relied mainly on the costs of environmental cleaning and disposal of the previous product (Özçelik & ŞenoI,2012:84)،In addition, environmental costs are often not tracked or hidden in public accounts within traditional cost accounting, as they can be an important component of the total cost structure of the economic unit, which leads to failure to include them in financial analyzes to send signals false financial to managers who improve the process, Pricing, capital budgeting, product mix, and other routine decisions(US-EPA,1998:2), Asthe exacerbation of environmental problems leads to a significant increase in the costs of environmental protection, it is necessary to undertake accounting of environmental costs by providing data on the various environmental impacts to be used by setting policies and taking appropriate decisions. Also, the effects of environmental degradation do not stop at national borders only, but pollutants can be transferred. From one country to another due to contemporary global developments, it is necessary to estimate the environmental costs of exporting external pollution so that the countries that cause this pollution can be asked to participate in sharing these burdens (Omar, 2017: 25), environmental costs are a kind of different types of costs Borne by economic units to manage pollution or maintain cleaner production, Also includes the costs of compliance with environmental standards as well as the voluntary costs that are spent that are used to enhance the health and safety of the economic unit (Ngwakwe, 2009: 40). Some authors have attempted to classify environmental costs, where the International Federation has classified For accountants (IFAC) in 2005, costs associated with the environment into four types, claiming that this classification depends

on accepted international practices on the scale of Broad scope and best practices as follows: -(Özçelik & ŞenoI,2012:84)

A. Costs of the type of environmental activity such as (waste prevention and control).
B. Costs represented by traditional accounting (such as labor, materials),
C. costs of the environmental field type (such as land, air, or water).
D. Costs that reflect the clarity of the data in the accounting records (such as hidden and clear costs).

Environmental costs were defined as the costs incurred by the company as a result of its commitment to implement a set of activities that would protect the environment from the DAMAGES OF THE ELEMENTS OF environmental pollution (Omar, 2017: 24-25).

The researcher (Grzebieluckas) asserts that there are difficulties in determining environmental costs, because the process of determining environmental costs requires an independent environmental cost accounting in the economic unit, as environmental costs are included in the manufacturing costs but are included in the costs of managing economic units, As environmental costs include all costs related directly or indirectly to environmental protection (Grzebieluckas, 2012: 335) such as:

a) Depreciation and depletion of the company's environmental assets.
b) Purchase of inputs to control, reduce or eliminate pollutants.
c) Treatment of product residues.
d) Get rid of the remnants of pollutants.
e) Restoration or repair of contaminated areas.
f) Labor used in control and prevention activities.

Among all the above-mentioned definitions, we may note that one of the most controversial points is "how to include or exclude losses, dues, fines, penalties, etc. from the environmental costs of the economic unit, where environmental costs represent the total expenditures that the economic unit incurs voluntarily or as a result of legal settlements. In order to protect or renew the impact of the activity of the economic unit on the environment (Rakos, 2014: 168).

2.2 : Types of environmental costs

The economic units bear a variety of environmental costs as a result of their commitment to implement a set of activities that will protect the environment from damage caused by economic units, as one of the most important goals for the economic unit is to clarify the types of environmental costs that managers must familiar with in controlling The environmental and economic aspects of their economic units, as researchers differ in their classification due to the novelty of this topic if we show some opinions of the classifications of researchers, writers and organizations: (Al-Shahmani, 18: 2018) .

First: Drury Classifications

Drury classifies environmental costs into four agencies :(Drury, 2012: 562-563)

A. Environmental prevention costs: They are the costs of the activities used to prevent the production of wastes that could cause environmental damage, such as (training employees, recycling products).
B. Environmental detection costs: These are the costs that are collected to ensure that the activities of economic units, their products and operations comply with the regulatory laws and voluntary standards such as (product inspection, environmental activities review, pollution tests).
C. The costs of internal environmental failure: They are the costs that arise from performing the activities that produce pollutants and wastes that are not discharged into the environment. These costs are charged to remove or reduce the waste to levels that are compatible with the regulatory requirements such as (scrap recycling, disposal Toxic substances).
D. The costs of external environmental failure: They are the costs that are incurred by the activities after the waste is emptied into the environment, such as (cleaning up polluted soil, and returning the lands to their natural state).

Second: the US Environmental Protection Agency rankings

The US Environmental Protection Agency has divided the environmental costs into two parts: (Al-Lami 21: 2019) (Duman.et.al,2013:90)

The first section: internal costs that directly affect commercial activities and can interfere with them, as they include four types of costs, which are as follows:

A- Conventional costs: These are the costs resulting from raw materials, machinery, equipment, and consumers of goods that may mask environmental costs.

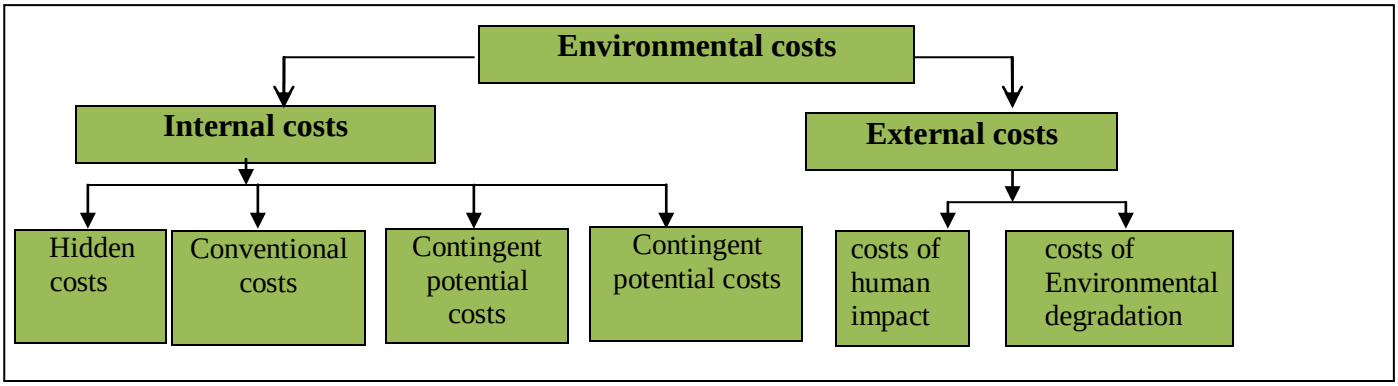
B- Hidden (hidden) costs: They are the start-up costs and the cost of the structure connected voluntarily with the application of certain rules, as these environmental costs are hidden and the costs of their disposal are more difficult.

C- Contingent (contingent) costs: They are the costs associated with future events, which are expected to be included in the category of risk judgments such as (damage risk).

D- Image and relationship costs: They are costs for improving the ecological image of the economic unit. This also lies in part of its responsibility on the marketing function, as it has an abstract formula more than any other costs. Image and relationship costs are among the most difficult costs to measure when compared to other environmental costs due to It is the abstract economic unit costs based on the personal portrayal of the manager, employees, customers and the public.

The second section: external costs so that the economic units do not incur responsibility and cannot interfere in them represented by (the costs of environmental degradation, the costs of human impact), as the divisions of environmental costs are shown in the following figure(1):

Figure No. (1) Classifications of environmental costs



Source: Duman, Haluk ,M. Yılmaz İçerli, Mehmet Yücenurşen, & İbrahim Apak, (2013), "**Environmental Cost Management Within the Sustainable Business**", p:90.

The above figure represents classifications of environmental costs according to the US Environmental Protection Agency divisions.

As researcher concluded the economic units bear items of expenses and costs as a result of their obligations to implement a set of activities that will preserve the environment from environmental pollution damage, called it (environmental costs), which economic units bear in order to harmonize the standards that coordinate environmental laws in addition This is to achieve the targeted growth rates and reach a cleaner production strategy.

2.2: Cleaner production strategy

The cleaner production strategy is a basic characteristic of environmental thought from the last decade of the last century, as it is based on efficiency in the use of resources during production processes, which leads to reducing emissions and waste and the consequent pollutants, as well as the role that it plays in enhancing the unit capacity Economic in achieving excellence for its products when competing with other economic units. Many researches and studies have focused on the operations of the CP strategy playing an important and major role in the success of economic units to maintain their competitive position (Qasim, 2017: 86).

2.3:Concept of the Cleaner production strategy

The cleaner production strategy is an integrated preventive strategy that aims to increase production efficiency through the optimal use of natural resources and the use of modern technology in production and reduce pollutants and emissions resulting from production processes from the source instead of spending costs in treating these pollution and emissions, and working to produce products that are environmentally friendly and recycle Recycling of waste , which leads to reducing the environmental costs used to treat it, as the cleaner production strategy requires concerted global, international and local efforts to adopt new policies in the field of industry and environmental preservation, and to transfer the skills and experiences of developed countries that have adopted modern methods to reduce the harmful effects of the environment to developing countries (Al-Sultani, 28: 2020) (Hens) defines the performance strategy of cleaner production as a preventive strategy used to reduce the effects of

production and products on the environment, as the economic unit is the one that controls the production processes and that is strongly influenced by its work and policy (Hens, 2018: 3).

2.4:Cleaner production strategy indicators

The process of implementing CP within the economic unit needs CP indicators, through which the CP strategy indicators can be divided into four strategies as follows:

1**. Efficiency strategy:** that it means the relationship between the cost of the inputs and the operation of the data with the value of the information provided by the accounting information system, that is, the comparison of the benefit of the outputs on the basis of the cost of the inputs and operations. (Dabaghah, Al-Saadi, 60: 2011)

2. Effectiveness is choosing or determining: the best methods of performance in order to reach the desired and predetermined goal, and we conclude from that that effectiveness is related to the ability of the accounting system to achieve its goals. (Dabaghah, Al-Saadi, 60: 2011)

3. Environmental economic strategy: It is concerned with measuring the link between economic performance and the effects of environmental costs, as it seeks to achieve a satisfactory stage of economic performance by seeking to achieve the least undesirable environmental consequences (Schaltegger, et. Al, 2008: 8).

4. Productivity strategy: means the relationship between the value or volume of production and the size or value of the productive factors used in the production process. In other words, it is the ratio between the product and its components, meaning the outputs on the inputs (Abdul Sattar, 8: 2009).

Where this research will focus on the environmental efficiency strategy:

Environmental Efficiency Strategy: It is a combination of skills and technologies that contribute to an explanatory method with the added value of the final product, as the Environmental Efficiency Strategy includes several competencies and according to the hierarchical level in the economic unit, as well as according to the multitude of functions in it such as planning, implementation, management and control. It is represented by the technical efficiency, the efficiency of human relations, and the technical administrative competence on the one hand, and on the other hand we see that it is represented by the efficiency of planning and management, the efficiency of implementation, the efficiency of control, as the concept of the environmental efficiency strategy is summarized by the economic unit and the type of its work and the extent of its understanding of the existing relations between it and the environment Surrounding it (Ben Alia, 2015: 100)

2.5: Relationship between environmental costs and Cleaner production performance strategy

Environmental costs are an important tool that can be relied upon by the business , as the United Nations / Environmental Programs Division has started to educate and encourage economic units to use environmental cost accounting techniques, because its information helps in improving the of the cleaner production strategy, As well as improving environmental management by providing environmental cost accounting with data on environmental costs and impacts (Doorasamy, 2015: 237-238), where we note that the environmental efficiency strategy is an important indicator, as environmental efficiency emphasizes creating value and excellence in the environmental field and business by increasing the value of goods and services and the exploitation of productive resources to the maximum It is possible to achieve financial returns for the economic unit, as it requires reaching the achievement of the cleaner production strategy in the economic unit through achieving the highest environmental efficiency, where environmental efficiency is a ratio of outputs (production quantities) to environmental impacts through the following equation (Al-Sultani, 35: 2020):

Environmental Efficiency = Outputs (Production Quantities) / Environmental Effects

As the environmental efficiency within the economic unit that can be measured, it depends on the mount of production and environmental waste in order to measure the environmental efficiency.

Third topic

3.1: Abrief Identification of the research sample company

Kufa cement plant is one of the factories of the General Company for Southern Cement Industry in Iraq, the plant was established in 1977 by the Danish company (FLS) and the area of activity is (5 km), and it is located in the province of Najaf / Kufa district / Al-Barakia region (7 km away) Km south of the city center, with a design capacity of (1781000) thousand tons per year, and a production capacity of 744723 tons for the year (2020), and it works in the wet method, which has less effects compared to the dry method, as the most important products of the plant are sulfur-resistant Portland cement and regular cement Based on the Iraqi environmental instructions for establishing projects (cement industry) and following up on safety and implementing them for No. (3) for the year 2011 that cement plants are classified as environmentally polluted and within class (A), where the Kufa cement plant was chosen as a site to study the current environmental reality and the most important environmental problems and obstacles that Obstructing the production process and knowing the efficiency of the means of controlling emissions and environmental problems by reducing or preventing them.

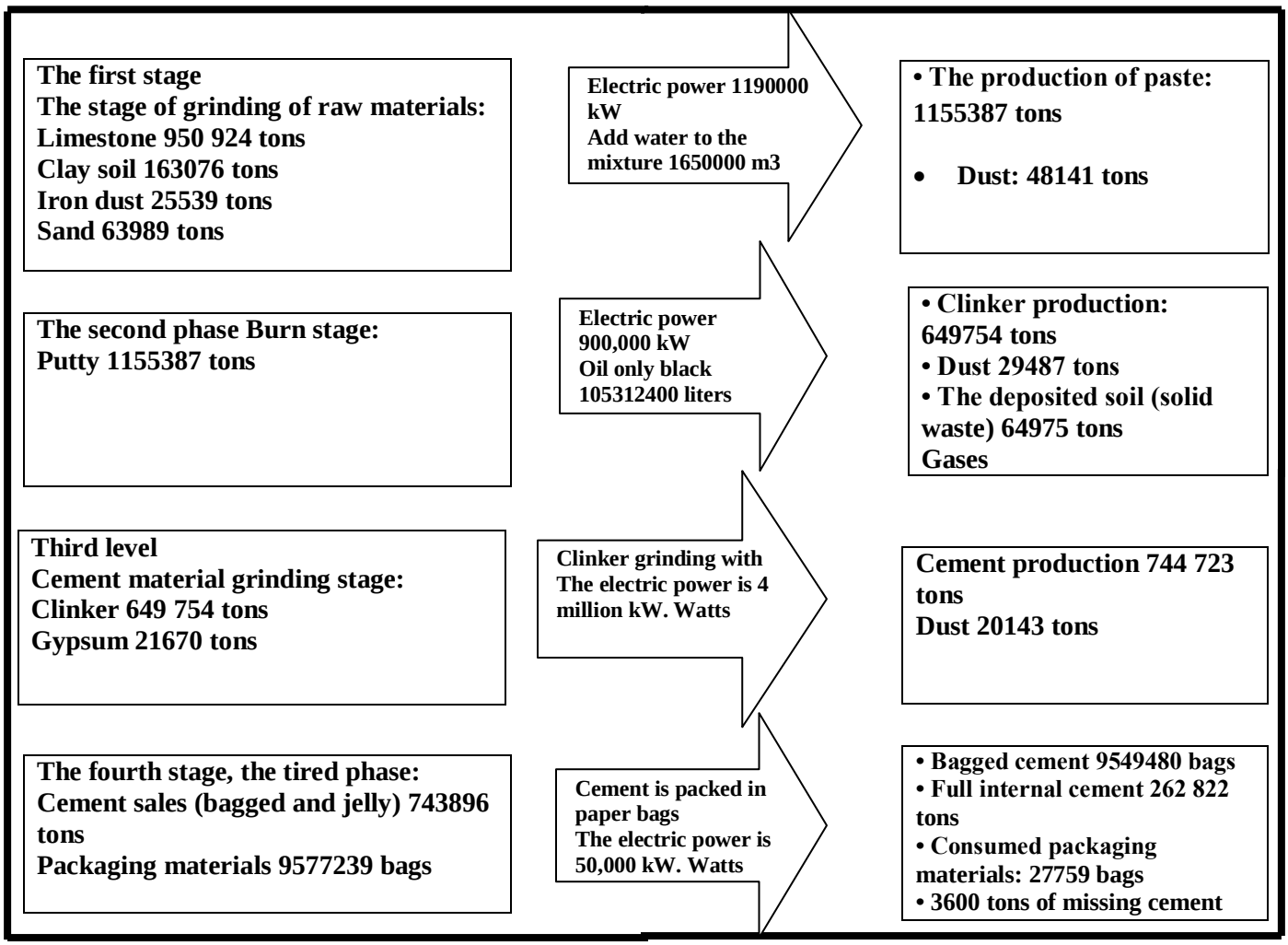
3.2: Calculation of environmental costs in the research sample company

A lot of pollutants are formed inside the cement plant during the cement manufacturing process, as many types of pollutants are produced from this process that have an impact on the environment surrounding the work site and society, as well as imposing additional wages on the economic unit, as if the raw

materials were used in the correct form and the production strategy was used The cleaners that help reduce the additional costs, as we will address the most important types of environmental pollutants inside the Kufa Cement Factory by determining the quantities of the inputs that contribute to the cement industry and knowing the amount of environmental pollution rates through a meeting with the specialists in the Kufa cement plant, as the proportion of dust from the raw materials was estimated In the first stage b (0.04%), as for the second stage the dust percentage as a result of burning the paste was determined (0.8%), and the third stage was determined by the dust percentage from the quantities of clinker (0.03), as for the flying dust as a result of burning the empty bags (torn and damaged) The number of bags has been determined through the packaging materials section in the Kufa cement plant, and the solid environmental materials (sedimentary soil) have been determined through the sediment section, and it can be represented The path of the production process in the Kufa cement plant through the following form(2):

(2)

flow path of the manufacturing process in the Kufa cement plant, not the input of materials, the conduct of operations and the completion of the outputs for his year (2020)



Through the above figure, the environmental costs (total non-commodity costs) have been determined from the amount of dust, deposited soil and lost cement, as in the following table(1):

Table (1) determining the environmental costs

Statement	Amount of residues, solids and packaging materials	*The cost per ton	The environmental cost of the materials
Cost the raw materials	75596 (tons)	7632	576948672
Cost the secondary materials	20143 (tons)	7724	155584532
Solid cost	64975 (tons)	2150	139696250
Finished cement is missing	79,290 tons	11300	895977000
Packing materials	27759 bags	246	6828714
Total non-commodity costs			1775035168

Source: Prepared by the researcher based on the cost division data.

As for the electrical energy used in the Kufa cement plant and the quantities of black oil and other petroleum materials, the environmental costs of these elements have been determined by using the proportion of waste that is calculated through the amount of waste / total amount of production and waste, as in the following table (2):

Table (2) calculating the percentage of production percentage of waste

Statement / year	production quantity	Amount of waste (Dust and deposited dirt)	Total mount of production and waste	Output ratio	Residue ratio
2020	744723	160714	905437	%82	%18

From the above table, electrical energy, black oil and oils are calculated as follows:

Energy management

The energy in Kufa cement plant is divided into three parts:

The first section electric energy: The Kufa cement plant uses electrical energy in large quantities in the cement production process, especially in the furnaces section, which causes the electrical energy to emit gases in the air, which causes the plant to incur additional environmental costs that it spends in order to reduce these emissions.

Therefore, the researcher believes that the use of alternative energy for electricity contributes to reducing gas emissions, as well as financial abundance as a result of reducing the expenditure of environmental costs.

* **The cost per ton was determined by the cost division.**

The second section, black oil: The Kufa cement plant uses black oil in large quantities by burning paste to produce clinker, which causes black oil to have large emissions that affect society and the environment, as it is considered the heaviest and most dangerous fuel used for its sulfur content, where the environmental costs are calculated From black oil as follows:

11393429371 x 18% = 2050817286 dinars, environmental costs

Section Three Oils and Lubricants: Those used as fuel for cars that are used to transport materials from mills to furnaces and vice versa, as appropriate foundations are used in the process of determining environmental costs, as we use the proportion of waste that was estimated at (18%) for the year 2020, and also the amount of other petroleum materials and oils was determined And grease through the cost division, the amounts of environmental costs for the year 2020 will be calculated as follows:

1254837617 x 18% = 225870771 dinars, environmental costs

As for solid waste management, it is done through:

Waste management

In the incineration stage of the clinker production, solid waste is produced from this stage, as the Kufa cement plant collects these deposits and disposes of them at a later time by contracting with an external contractor who transports these wastes to remote locations to then bury them instead of using them for other purposes. Obtaining the amount of precipitants from the Environmental Division of Kufa Cement Factory and that the amount paid to the contractor (2000) dinars per ton for waste disposal are as follows:

64975 x 2000 = 129950000 dinars, environmental costs

Through the above calculations, the environmental costs can be represented in the Kufa cement plant, as shown in the following table (3):

Table (3) Environmental costs in Kufa Cement Factory for the year (2020)

Statement	Unproductive environmental costs	cost of removing the deposited dust	Prevention costs
Total non-commodity costs	**1775035168**		
Black oil	**2050817286**		
Oils and greases	**225870771**		
Wastes removal		**129950000**	
Prevention costs			**344285510***
Total environmental costs	**4051723225**	**129950000**	**344285510**

Source: Prepared by the researcher based on the above table.

***The amount of prevention was determined through the trial balance for the year 2020**

3.3: Explain the role of costs in improving environmental efficiency indicators in Kufa Cement Plant

The material environmental cost accounting information is used in the implementation of the environmental efficiency strategy as one of the objectives of the cleaner production strategy at Kufa Cement Factory in order to measure environmental efficiency before implementing cleaner production, as well as after implementing cleaner production, and as shown in the table () by using the following equation:

Environmental Efficiency = Quantity of Production / Quantity of Waste with an Environmental Impact

=744723/ 160714 = 4.6

We note that the environmental efficiency in Kufa Cement Plant reached 4.6 before the implementation of the environmental efficiency strategy, as the environmental costs can be measured after implementing the environmental efficiency strategy by reducing the amounts of dust and sediments as follows:

Reducing the amount of dust and sediments after applying the cleaner production = amount of dust residues / amount of production

= 160714/744723 = 22%

We note that the costs of dust and deposits will decrease by (22%), as reducing the amounts of dust and sediments in the Kufa cement plant contributes to increasing the environmental efficiency inside the plant, where the environmental efficiency can be measured after implementing the cleaner production strategy and before implementation through the following table(4):

Table (4) Environmental efficiency in Kufa cement plant before and after implementing the CP strategy

Year / Details	2020
production quantity	744723
The amount of dust and sediments before implementing the CP	160714
The amount of dust and sediments after implementing the CP	125357
Environmental efficiency before implementing the CP strategy	4.6
Environmental efficiency after implementing the CP strategy	5.9

Through the above table, we note that the amount of environmental efficiency before implementing the cleaner production strategy reached (4.6) However, after implementing the CP strategy, the amount of environmental efficiency increased to (5.9). This indicates the extent of the importance of the cleaner production strategy that helps the Kufa cement plant to Exploiting large amounts of costs that were to be spent in order to treat environmental pollution caused by flying dust and solid waste, so that reducing environmental costs will increase the productivity of the plant and improve environmental performance and this is consistent with the research hypothesis. ((Is there a role for environmental costs in improving the efficiency of the economic unit in the Kufa cement plant in light of the cleaner production performance strategy)).

Conclusions and recommendations

First / conclusions

1- The cement industry is considered one of the dangerous and environmentally polluting industries, as the cement industry is one of the largest pollutants in Najaf Governorate, as the Kufa cement plant is classified as a class (A) pollutant.

2- The Kufa Cement Factory has not followed any technique to reduce the environmental costs, and also not to follow any method for separating the environmental costs.

3- It was noticed that there is a clear deficiency in the Kufa Cement Factory in the aspect of the standard accounting system followed through the non-disclosure of the environmental costs inside the plant.

4- Most of the economic units merge the environmental costs with other accounts, which made it difficult to account for them

5- It was noted that there are deficiencies in the Kufa cement plant, which is clear by not using any environmental strategy to protect the environment and society.

6- The environmental costs of raw materials and emissions can only be extracted by using modern accounting techniques.

7- Environmental costs can be calculated using the material flow path technique.

8- The cleaner production strategy is one of the important strategies that are used to improve the environment by reducing emissions and pollutants harmful to the environment and the optimal use of natural resources.

9- Environmental costs for the year 2020 amounted to more than (4495958735) billion dinars, of which the costs of unproductive units constituted (89%). This amount is not considered costs for protecting the environment, but rather a lack of commitment to environmental standards and a complete waste of a product that was released with the air as dust.

10- The environmental costs accounted for (6%) of the production costs, as these environmental costs were borne by the Kufa Cement Factory for not being committed to preserving the environment, so it was a burden on production costs.

11- The implementation of the environmental efficiency strategy inside the Kufa cement plant contributed to reducing the quantities of emissions and deposits, as before the implementation of the cleaner production strategy it was (160714) tons and after the implementation of the cleaner production strategy (125357) tons, with a reduction rate (22%).

12- Prevention costs amounted to (344285510) million, distributed to biodiversity and landscape improvement.

13- The results achieved from applying the environmental efficiency strategy amounted to (353570800) million Iraqis.

Second / recommendations

1- The necessity of applying environmental cost accounting in economic units to help provide information and data on pollution and emissions inside the Kufa Cement Factory.
2- The necessity of training employees and accountants to use modern accounting techniques in separating and measuring environmental costs in Kufa Cement Factory.
3- Encouraging industrial economic units to apply environmental cost accounting, providing tax exemptions to economic units that implement them, and imposing penalties and fines on economic units that cause environmental damage.
4- The introduction of a cleaner production strategy in the Iraqi industrial sectors, especially in the cement industry, as it helps in reducing pollutants and emissions, as well as reducing environmental costs.
5- Working on implementing the best programs of cleaner production strategies in all economic, social and environmental aspects by the Kufa Cement Factory, especially the environmental efficiency strategy.
6- The economic unit should reduce the environmental costs to the lowest possible level through the use of the cleaner production strategy technique that reduces the environmental costs.
7- Providing devices for measuring harmful gases and emissions and training staff working on measuring and controlling harmful emissions.
8- Replacing the current machines and machines with machines and machines that are environmentally friendly, with less harmful emissions, as well as less energy consumption and high production efficiency, in addition to purchasing precipitators and filters to filter the air so that it is of high environmental efficiency in which the proportion of flying dust is low.

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