



NEW GREEN ECONOMY POLICY INTEGRATING THE ECONOMIC DIMENSION IN THE FACE OF ENVIRONMENTAL PROBLEMS IN THE CASE OF A MOROCCAN AGRI-FOOD COMPANY

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ABSTRACT

As it is still possible to avoid major environmental risks for businesses, the transition to a green economy is now a global concern. However, this transition is conditional on the existence of good faith to preserve the environment by targeting investments that aim to reduce negative environmental impacts. In this article, we have proposed a new policy integrating the economic dimension of environmental problems. This policy appears as a development opportunity and perceived as a new front on which companies must be present to remain competitive. Our objective is to encourage small businesses to engage in an environmental management approach and to show large companies why an improvement in a company's economic performance can go hand in hand with an improvement in its environmental performance. To illustrate the deployment of this policy, a case study is carried out in a Moroccan food company. The results obtained show that the proposed policy helps to mitigate the negative impact of the company on the environment. Indeed, the flagship projects developed justify a level of environmental performance and allow the company to achieve visible results in terms of economic performance. In concrete terms, this work will enable all industrial companies to produce better with fewer resources, that is to say, to rationalize and reorganize the resources consumed in all processes. In addition, our contribution to the field of research consists in the design and implementation of a green economy policy that will make it possible to achieve significant savings.

Keywords: green economy, investment, environment, sustainable development, ISO 140001.

JEL classification: Q20, Q30, Q50

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INTRODUCTION

Currently, there is a trend for companies to focus on proactive environmental management systems, on the conservation of natural resources and on the performance of techniques to reduce energy use, waste generation, consumption of raw materials, ... It is not innocent; companies wish to implement such an approach for several reasons. First of all, by implementing a new green economy policy, companies can reduce their energy costs. Indeed, by promoting cleaner energy or by hunting down waste, the company can reduce its costs and be more profitable (Akhmedyarov, 2019; Ramazanov & Petrova, 2020; Odinokova & Akhmedyarov, 2022; Petrova et al, 2022). Then, in terms of image and notoriety, the benefits of such a policy are more than positive, because customers



are satisfied with the company and it is a very strong signal that is sent to the company's future customers. Finally, in terms of compliance with regulations. Indeed, legislation concerning environmental protection is evolving rapidly, permanently, and the texts show great complexity in their understanding (Bounit and al, 2017).

The activities of companies can have harmful impacts on the environment through the emission of polluting products or the exploitation of natural resources such as energy, water, ... It is generally accepted that controlling, reducing or eliminating these impacts imposes additional costs on companies as a result of their compliance with the requirements of the ISO 14001 standard and those of the regulations. These costs represent those of operation, implementation and certification of the ISO 14001 EMS, of which only the richest companies are able to assume the financial consequences. In fact, the amount of operating expenses is much higher than the amount of implementation expenses, since the EMS is based on a process of continuous improvement.

The environmental management system is proving to be an economically useful instrument for companies since it is a source of competitive advantage. It has become an opportunity for development or a compensatory factor that allows them to make their expenses profitable. The growing environmental concerns of citizens and the prospect of major summits are leading public authorities to consider new environmental policies that will require investments on companies to reduce their negative environmental impacts (Jarmusevica et al, 2019; Mussapirov et al, 2019). The latter are generally costly for the companies that are subject to them. However, the short-term cost can be transformed into long-term benefits for those that know how to innovate in their production process or organization or use their image as a "greener" company offering cleaner products to conquer new markets or attract capital (Ambec et al., 2009; Baudry, 2009) explains that a company involved in an environmental management approach is a company that hopes to achieve visible results in terms of its economic performance.

Many companies in the food industry have implemented the EMS system and some are certified or are in the process of being certified according to "ISO 14001 V 2004". The EMS involves, on the one hand, the development of policies and guidelines that allow the establishment of objectives and programmes that allocate environmental responsibilities. These responsibilities relate to any organizational structure, its training and communication activities. On the other hand, according to the European Commission in 2006, the EMS involves carrying out surveys and audits. Its vocation is not to impose or establish environmental performance criteria but to provide a methodology to control the environmental aspects inherent to the organization's activities. This methodology is based on the optimisation of processes, the anticipation of emergency situations and the verification of its capacities for action, reaction and monitoring (Vinel, 2011).

Sustainable development is a development that takes into account three dimensions: economic, environmental and social. Indeed, the concept of the green economy is defined by UNEP as: "an economy that leads to improved human well-being and social equity while significantly reducing environmental risks and resource scarcity". The goal is essentially to succeed in stimulating economic growth without increasing the



level of greenhouse gas emissions or depleting natural resources. Above all, it represents the economic pillar of sustainable development, taking into account environmental and social factors.

Today, most Moroccan companies are late in obtaining ISO 14001 certification and others are not showing visible results in terms of its long-term economic performance even though it has deployed this environmental system. This is explained, on the one hand, by the fact that the business fabric is essentially made up of 95% of small and medium enterprises and being that its financial resources are insufficient in addition to the fact that the process of complying with the EMS is costly for them. On the other hand, the large companies do not realize the long-term benefits, since they use already existing structures at the time of their investments, i.e. they plan to make new with old.

It would be preferable to rethink all the ways of managing, i.e. to question current management techniques in their entirety by widening the scope of action on the economic aspect and not in a partial way as proposed by the environmental management systems and the ISO 14 001 standards. Therefore, the implementation of a green economy policy seems to be a more global approach that places economic aspects in environmental concerns.

Our objective in this article is to propose a new green economy policy that integrates the economic dimension in the face of environmental problems. We aim to encourage small companies to engage in an environmental management approach and to show large companies why an improvement in a company's economic performance can go hand in hand with an improvement in its environmental performance.

In concrete terms, this work will enable all industrial companies to produce better with fewer resources, i.e. to rationalise and reorganise the resources consumed in all processes. Besides, our contribution to the field of research consists in the design and implementation of a green economy policy that will enable large savings to be made.

The rest of this article is organized as follows: the following section describes the methodology adopted. The case study is presented in section 3. Then, discussion and results will be summarized in section 4. Finally, section 5 concludes the article and also provides openings for future work.

METHODOLOGY

In our work, we are proposing a new policy that integrates the economic dimension with environmental problems. The aim is to achieve long-term profits by making medium-term investments such as reducing the impact of the company's activities on the environment, rational use of resources including water, energy and raw materials, reducing pollutant emissions, limiting waste production, recycling and recovery.

To achieve this goal of this work, we follow five main pillars:

- The consumption of hydrocarbon resources "Eco-Innovation".
- The consumption of water resources "Water-Economy".
- Energy consumption "Eco-Energy"
- Responsible distribution "Eco-Distribution"



- Limitation of the impact of activities on the working environment "Working environment"

Pillar 1: eco-innovation

Eco-innovation will be an essential part of industry efforts to counter climate change and achieve “green growth” in the post-Kyoto era. It calls for faster adoption of technological breakthroughs and more general application of existing solutions, including non-technological ones. It also provides an opportunity to involve new players, develop new business sectors and increase competitiveness. The restructuring of economies will be imperative in the decades to come.

Eco-innovation can be defined as an innovation that results in a decrease in environmental impact. Any innovation that leads to significant progress towards the goal of sustainable development by reducing the environmental impact of our production processes.

- The different eco-innovation activities can be analysed along three dimensions:
- Objectives (target areas of eco-innovation: products, processes, marketing methods, organisations and institutions).
- The mechanisms (how the objectives are changed: modification, redesign, substitution and creation).
- Impacts (effects of eco-innovation on the environment).

Pillar 2: eco-energy

Energy savings are actions carried out to limit energy consumption or to avoid losses on the energy produced. For a company, consuming less energy means becoming more competitive. However, still few companies are aware of the level of energy losses they suffer daily, often due to a lack of management or simply a lack of measurement.

Pillar No. 3: water-saving

Today, water is becoming scarce. Not because there are fewer of them, but because the needs are increasing and because the quality of the resource is deteriorating and the possible effects of climate change could modify its availability. We know that this scarcity is largely the result of poor management: management that does not encourage the economical use of water; which does not systematically allocate water where it is most useful; which does not encourage enough to preserve the quality of the resource.

Businesses and industries also have an important role to play in water conservation. They can implement techniques to optimize their water management. Despite the efforts made by industrialists to reduce consumption and reuse or recycle all or part of the water used, the agri-food sector remains, by the very nature of its activities, a large consumer of water, the quality of which must absolutely be ensured and guaranteed... while saving it.



Pillar No. 4: eco-distribution

Eco-distribution, or responsible distribution, aims to reduce society's impact on hydrocarbon consumption and air pollution.

Optimizing the overall transport strategy can allow us to achieve cost savings through maximum fuel economy. Smart route planning means drivers travel fewer miles and spend less time and money refueling. They also avoid empty trips and make sure to always refuel at the best time and at the lowest cost, which can also help to lighten the overall fleet. This can make the difference between whether or not the business is profitable and helping to achieve KPIs, as the cost savings can be highly measurable.

Pillar 5: Work environment

Every organization is different and so is its impact on the environment. Those that hold an ISO 14001:2015 certification ensures they are being good stewards of our environment.

An ISO 14001 certification ensures that there is “a framework that a company or organization can follow to set up an effective environmental management system,” per the International Standards Organization (ISO). “Using ISO 14001:2015 can provide assurance to company management and employees as well as external stakeholders that environmental impact is being measured and improved.”

Organizations using ISO 14001 have found success across a range of areas, including:

- Reduced energy and water consumption
- A more systematic approach to legal compliance
- Improved overall environmental performance

CASE STUDY

To put our methodology into practice, we carried out a case study within a Moroccan agri-food company. Strongly involved in environmental preservation, the Mineral Water Company has always sought to create significant benefits through the establishment of responsible management, the adoption of optimal management of natural resources and the reduction of the impact of its activities on the environment.

The company's vision for 2023 is to strengthen and capitalize on its position as a responsible national leader and the number one continental player in the agro-industry for the hydration of the consumer throughout his life.

RESULTS AND DISCUSSION

At the level of each major pillar, we have developed several flagship projects with a common referent: "the eco-responsible dimension to considerably reduce the impact of its products and activities on the environment":

Pillar 1: eco-innovation



Four main projects were undertaken to control the impact on its consumption of hydrocarbon resources:

Project to limit oil resources at source (preform manufacturing):

A major mega-project to reduce the weight was implemented in this area, which generated significant gains in terms of fossil fuel energy savings, without forgetting the environmental dimension of this initiative. The objective of this project was to reduce the consumption of petroleum derivatives (PET) at source by reducing the weight of preforms. This project required a considerable investment in the purchase of new preform moulds (11.3 grs, 14.3 grs, 23 grs and 75 grs).

Following a careful monitoring through the weight ratio indicator per product, the targets are per format: 33 cl format: 5.83% (i.e. 0.7g), 50 cl format: 4.67% (i.e. 0.7g), 100 cl format: 8% (i.e. 2g) and 5 L format: 6.25% (i.e. 5g).

The results of this project represent an annual saving of 400 Tons of PET savings per year and preservation of energy consumption equivalent to 320 MWh per year.

Project to create new, more environmentally friendly formats:

The objective of this project was to create new formats not existing on the market that are more economical for the consumer and have a more interesting water/PET ratio consumed. The ecological gain expected from this project was the optimization of the water used for bottling in blown bottles. It concerns all formats. It required a considerable investment for the development and acquisition of blow moulds for the different formats to be developed. Evaluation of the achievement of the objectives was carried out using careful monitoring through the indicator of weight rate per cl of water produced, for which targets were set per format. The results of this project represent a valorization corresponding to the bottling of an additional quantity of water for the same weight of PET.

Optimization of Raw Materials and Consumables:

The objective of this project was to reduce Company X's consumption of Raw Materials and Consumables of hydrocarbon origin. It concerned several types of MPC, namely: labels, caps, heat-shrinkable film and food covers for "preform" packaging.

➤ *Packaging of preformed cartons:*

This project consists of replacing the plastic cover that covers the preformed cardboard with a stretch film. It was the subject of the acquisition of 5-strip banderoles for preformed box packaging. This not only reduces the environmental impact but also better locks out the risk of contamination produced by foreign bodies (pests, dust, etc.). An indicator has been set up to measure the impact of this measure on our consumption of hydrocarbon-based PCBs by measuring the difference in plastic consumption. This substitution has enabled the company to save 20 tons of plastic.

➤ *The labels:*



This project involved reducing the height of the labels for certain formats of company X. It did not require any technical investment but a specific development carried out jointly by the technical teams, the marketing team, the suppliers of labels and bottling machines as well as the communication agency. It achieved its goal of reducing the height of each label by 32%.

➤ *Caps and handles size 5L:*

This project concerned the reduction of the height of the caps for the 5L formats of company X. It did not require any specific additional investment on the part of the company. Indeed, the reduction in the height of the preform necks was already taken into account when developing the project to reduce the preform weight. It required some effort on the part of our partners who complied with the requirements of this project. The height of the closures was reduced by 10 mm (48mm -> 38mm), which represents a saving of 20 cents per collar produced.

➤ *Heat-shrinkable film:*

This project concerned the elimination of heat-shrink film for the packaging of 5L cans on. It required a specific investment concerning a glueing machine and also a new type of glue. It is expected that this project will lead to a saving of 12g of plastic per can. Evaluation of the achievement of the main objective was carried out through careful monitoring through the following indicators:

- MPC consumption gap, i.e. 53 Tons of plastic per year
- Monitoring the energy consumption of the shrink-wrapper, 70 MWh per year

Pillar 2: eco-energy

The "eco-energy" pillar relates to energy consumption. It is based on two fundamental aspects: energy efficiency through the supervision of consumption, using energy meters that allow instant monitoring of electricity consumption, and energy efficiency by adopting an investment policy in high-speed production lines and new technologies that are less energy-consuming.

➤ *Technology acquisitions:*

Company X's new acquisitions have taken into account all the requirements implemented by the Integrated Management System. As a result, new machines enable better industrial performance while optimizing energy consumption.

Company X has acquired a P PS 144 cavities machine which allows a 30% reduction in power consumption and a 30% gain compared to the PPS 96 machines. A cooling unit has been installed, which allows a 30% gain in energy efficiency.

Following the measurement of the plant lighting, it was decided to install sol lubes for the lighting of the clean rooms and dark rooms. This technology allows the premises to be illuminated during the day by redirecting the sun's rays, allowing a 100% reduction in electricity consumption during the daytime needs of the personnel.



➤ *Supervision of consumption:*

This project carried out on all the company's sites aimed to carry out supervision of electricity consumption by a source of consumption (all the manufacturing stages of our finished product are under supervision). The main investments made in this direction are the installation of communicating energy meters on a Modbus network. The data is now available and used to immediately adjust any anomaly detected during the continuous measurement of the consumption of all the components of our production machines.

Pillar No. 3: water-saving

The water-saving principle which makes it possible to act upstream by recovering lost washing water and downstream by treating the wastewater at the WWTPs.

The consumption of water resources:

The "ecology" pillar, linked to the principle of optimizing the conversion rate to respect the regeneration time of the water table.

Recovery of lost "washing water":

The aim of this project was to monitor and rationalise water consumption. It made it possible to recover the water lost during the washing stages of the bottling process. This water is reinjected into the treatment tanks at the water treatment plant. It required investment for the installation of recovery pipes and water connections. Evaluation of the achievement of the main objective was carried out through careful monitoring through the following indicators:

- Water consumption: saving of 100 m³ of water per day (10% reduction in the Lydec bill)
- Number of litres of water consumed per bottle produced

Pillar No. 4: Eco-distribution

This project aims to optimise and reorganise the direct and indirect delivery channels, which has required investment in terms of training and awareness-raising on eco-driving for the various players in the distribution chain". Noting that this project has made it possible to improve the ratio of hydrocarbon consumption per litre of water sold, per centre and sector. Responsible distribution aims to reduce the impact of society on several levels:

- Hydrocarbon consumption
- Optimization of employees' working time
- Optimization of sales efficiency



Pillar 5: Work environment

- ISO 14001 Certification
 - Company X has implemented an environmental policy.
 - company X is committed to reducing the impact of its products and activities on the environment and has carried out its first carbon balance sheet.
- Precaution in the face of environmental problems:
 - Identify any soil and water contamination on the site, assess the environmental impacts and correct any significant contamination.
 - Ensure regular maintenance of environmental protection systems (air pollution control, wastewater treatment systems, etc.).
- Prevent and reduce waste production and ensure responsible waste management:
 - Use approved subcontractors for the transport, recycling, treatment and disposal of hazardous waste.
 - Manage waste responsibly and continuously strive to prevent and reduce waste generation.
 - Sort waste suitable for recycling and hand it over to a recycling company

CONCLUSION

Companies only agree to integrate Financial and environmental constraints into their daily operations if they perceive the opportunity to obtain interesting counterparts. The proposed green economy policy appears as a development opportunity and is seen as a new front on which business must be present if it is to remain competitive. In order to illustrate the deployment of this policy, a case study is made in a Moroccan company. The results obtained show that the proposed policy contributes to mitigating the company's negative impact on the environment. Indeed, the flagship projects that have been developed justify a level of environmental performance and they enable the company to achieve visible results in terms of its economic performance.

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Conceptualization, I.D; methodology, I.D; formal analysis, O.L; data curation, K.V.; writing- original draft preparation, K.V.; writing - review and editing, I.D.

All authors have read and agreed to the published version of the manuscript.

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Informed consent was obtained from all the participants involved in the study.

Data Availability Statement:

The data presented in this study are available on request from the corresponding author. The data are not publicly available due to privacy issues.



Conflict of interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and publication of this article.

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