

MEDITERRANEAN

Sustainable Business Management:

Making It

Profitable to be

Environmentally-Friendly

CLEANER

production

Regional Activity Centre for Cleaner Production (RAC/CP)
Mediterranean Action Plan



Regional Activity Centre
for Cleaner Production



MINISTERIO
DE MEDIO AMBIENTE



Generalitat de Catalunya
Government of Catalonia
**Department of the Environment
and housing**

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If you would like to request any extra copies or receive any additional information, please contact us at the following address:

Regional Activity Centre for Cleaner Production (CP/RAC)

Dr. Roux, 80
08017 Barcelona (Spain)
Tel. +34 93 553 87 90 - Fax. +34 93 553 87 95
E-mail: cleanpro@cprac.org
Website: <http://www.cprac.org>

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Foreword

The Regional Activity Centre for Cleaner Production (CP/RAC) is working within the framework of the Mediterranean Action Plan to encourage industry in Mediterranean countries to follow sustainable production guidelines by using techniques and practices that lead to a reduction in pollutant emissions at source.

Moreover, Fundació Fòrum Ambiental is seeking to set up a permanent platform for dialogue and collaboration among companies, public authorities and the rest of Catalan and Spanish society in order to establish a more sustainable development model than the current one. It specifically proposes making environmental culture a part of business culture and encouraging sustainable development principles as an inherent part of any business practice.

The two bodies have joined forces to produce this manual and promote a business development model that makes environmental and social aspects key parts of correct company management in Mediterranean companies.

The manual, which was written by Marta Roca and Josep María Salas, two economists with longstanding and extensive professional experience, seeks to show how it is impossible to continue with development models that do not take these aspects fully into account. The difficulty arises when one starts to look at how to achieve this, i.e. how this new vision of a proactive company can be applied, and how the new variables can coherently be made part of the existing economic model in the country the company operates in, without creating divisions or territorial inequalities in the global economy.

The manual carefully sets out all of the aspects that companies of any size should consider in order to make environmental matters part of their everyday practices, which includes new aspects of knowledge management, sustainability, financial measurements and economic and environmental analysis, as well as bringing all these policies together in balance sheets and profit and loss accounts.

This document has been designed to be used as a reference book, which it is worth having to hand, since it does not provide an introduction to the matters, but provides solutions which, while they may not be simple, are clearly presented.

The CP/RAC and Fundació Fòrum Ambiental are pleased to have achieved the objective we set for ourselves and are convinced that it will be useful as a work tool for managers committed to sustainable development in the Mediterranean.

Carles Mendieta

Director of Fundació Fòrum Ambiental

Virginia Alzina

*Director of the Regional Activity Centre for
Cleaner Production*

1. COMPANY POLICY, KNOWLEDGE MANAGEMENT AND SUSTAINABLE MANAGEMENT

1.1. INTRODUCTION

This chapter mainly focuses on the implications of defining company policies based on sustainable development as a more and more determining factor within the scope of a company.

Firstly, the changes in the behaviour of companies are identified due to sustainability being included in their policy, objectives and strategies.

Knowledge implies a challenge and a need to provide suitable responses. The object of headings two and three is related to the implications of knowledge and its management, based on the environmental factor being a part of sustainability.

Faced with the change implied by considering environmental issues and the responsibilities related to them, a company may adopt two attitudes: proactive and reactive. The determining characteristics and behaviour of both attitudes are part of the last heading in this chapter. There is also a questionnaire to clarify whether it is worthwhile to include sustainability in the corporate sector.

After reading this chapter we can stop asking “is it worthwhile?” and start asking “how do you do it?” which is answered in the second chapter.

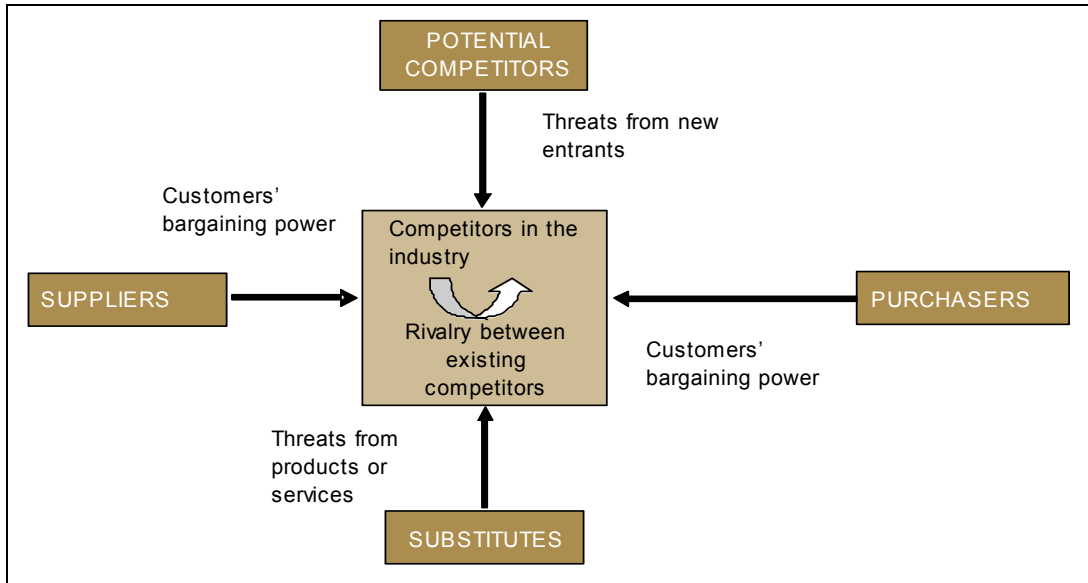
1.2. POLICY, OBJECTIVES, STRATEGIES, COMPANY MANAGEMENT AND SUSTAINABILITY

There are many different ways of explaining how a company works. One thing we can all agree on is that a company is an organisation that takes decisions that affect the society it operates in. Deciding always involves making a choice, choosing one thing over another.

A company's behaviour is nothing other than the sum total of the decisions it takes, observed over a sufficiently long period of time. How one views this behaviour depends on the aims of the person studying it. However, we can agree on two facts that explain most kinds of behaviour:

- a) A company tends to create value through its behaviour, at least a form of economic value recognised by the market, which values its products at a “market” price, which should allow the company to remain in operation.
- b) A company is on the look-out for new market opportunities and is sensitive to changes in the market's behaviour. It is not infrequent for it to play a part in changing behavioural habits in the market.

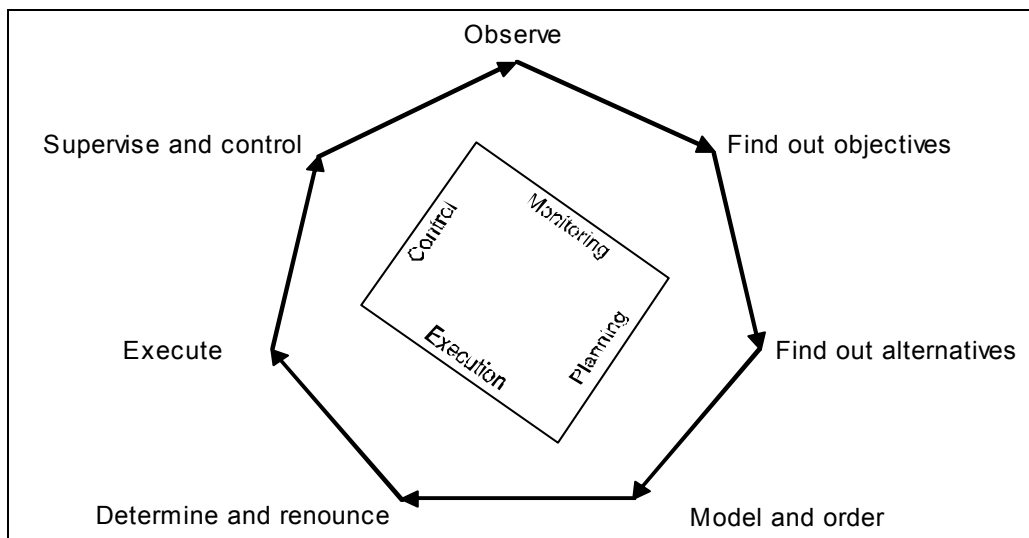
Various forces cause this concept of a market or, rather, markets, to behave in a way that changes over time, that evolves. Porter's model (competitive strategy) is a well-known example of this.



Forces behind competition in an industry. Michael E. Porter

This model is dynamic due to various aspects that condition all of the actors in the model. These may include certain demographic factors, the pace of technological growth and medical advances, etc. Several forces affect the behaviour of the social agents that companies directly or indirectly have contact with.

One should not overlook the effect that the economic policy of states and groups of countries has on business dynamics, as well as the effects of a single currency, the growth of a deregulated energy market and unified infrastructure (open skies) among others.



Increasingly widespread knowledge has enabled companies to be in contact with practically the entire world. So-called globalisation is an example of this. We view the global economy as being an economy in which the dominant strategic activities operate as a unit on a planetary scale in real time. It is also an information (knowledge) based economy in which increases in productivity do not solely depend on a quantitative increase in the factors of production, but on the application of knowledge and information in the management, production and distribution of both processes and products.

The mechanism through which a company adapts can be found in the process through which it acts: planning, execution and control. It decides what action to carry out in the more or less distant future, it carries it out in accordance with the company's technology and structure and, from time to time, compares the results of its actions with the expected results. It monitors and controls them.

We can thus easily interpret a decision-making cycle as: planning-execution-monitoring-control.

The last function will cause the initial decision to be modified or new decisions to be taken. In this case, it is not a matter of classifying the decisions being taken in a company (their importance, repetition, repercussions, etc.). We can all agree that decisions are not taken in isolation, quite the opposite: they spring from mutual interest, they are organised. To some extent, one could say that they are part of a strategy that has also been adopted through a decision.

The various strategies make sense as means to achieve objectives, variables with certain values that the company's management considers appropriate. There are many different objectives, such as image, profit, and training objectives, among others.

These are also decided through a decision taken by the company's competent body. The sequence of these objectives highlights the policy the company is following, whether a leadership, follow-the-leader, or constant innovation policy, for example.

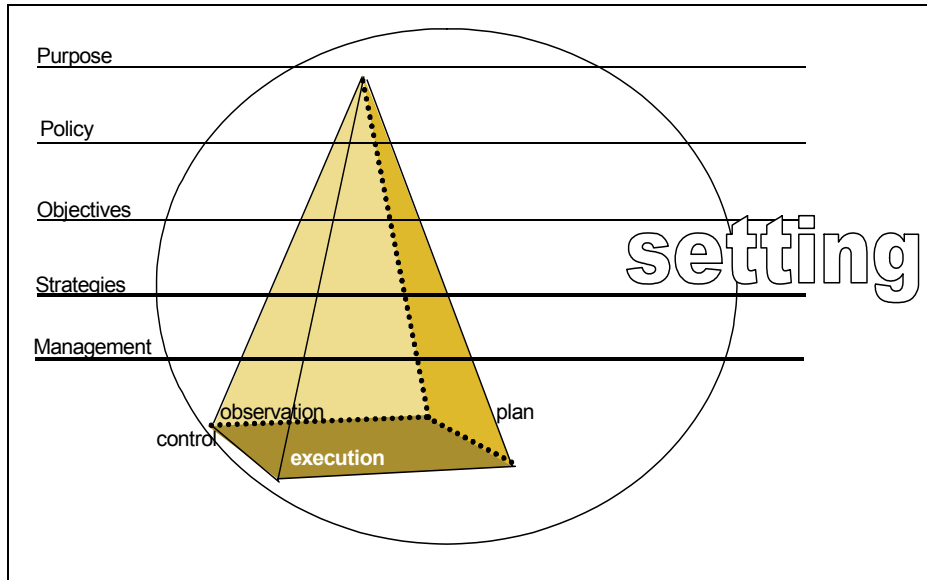
A policy is a way of managing to carry out the purpose for which the company exists, the idea its shareholders have for it. It is often set out in two public documents: the company's mission statement and the code of conduct.

The purpose of a company is the embodiment of its *raison d'être*, the expression of its business core and the form characterising all of its activity. It is often seen as the mission the company has in relation to its business. It should not be confused with the term "corporate vision", which focuses on analysing its perception of the variables in the context or setting it in.

In order, from more general to more specific, we have:

- A vision of the world the company is in.
- The company's purpose: what it intends to contribute.
- Policy: how and the style in which it intends to do it.
- Objectives: what it proposes doing.
- Strategies: it determines which actions make it possible to achieve the objectives.
- Management: how to carry the actions out efficiently.

Obviously, this whole structured process is not carried out in a bubble, in isolation from the outside world. Quite the opposite: it is in contact with the society the company operates in, which changes itself, changes behaviour and conditions the validity and effectiveness of the company's actions.



Source: own data

The company's response to changes in its setting is to examine the implications this has for its purpose, policy, objectives and strategies. Sustainability is a factor that requires a change to the company's vision and causes it to question its purposes. One of the most active forces in the development of the prevailing situation is the economic policies followed by states and international bodies.

Economic policies in the last third of the 20th century were designed within a growth context in which the environment was not taken into consideration or was treated as an exogenous factor, the limits of which were subject to technological development. There have been such frequent instances of situations in which resources have been wasted that they have created a widespread impression, at least in much of the Western world, of living in a culture of excess (see the document "Late lessons from early warnings: the precautionary principle 1896-2000" by the European Environment Agency).

The adoption of mainly economic criteria in government policies has led to a situation in which there are clear adjustment problems, which we can group into three categories:

- a) Efficiency. Since not all the components are assessed (the environmental aspect is left out), the valuation of products and services leads to over-consumption of certain items, especially non-renewable resources.
- b) Fairness. Assets are not proportionately distributed among the various areas of the planet nor, foreseeably, between generations. A great deal of research has been carried out into north-south relations. There is nothing strange about looking for ways of determining the impact of this policy of concentration. For instance, the "ecological footprint" indicator as an attempt at showing up the inconsistency in the asymmetrical growth model in figures.

We are in a socially unsustainable situation as the social tensions created by growing inequality between countries are reaching breaking point.

- c) Awareness that the growth model should include quality variables.

Unrestrained growth can end up reducing quality of life. The current emissions of substances are exceeding the planet's physical system for assimilating and coping with it.

Social agents – the decision-making bodies in the company's setting – plus governments, trade unions and consumers, among others, have changed the way they view environmental matters: Three significant aspects can be noted:

- a) There is a growing impression that the environmental (physical) system's drainage capacity is reaching its peak.
- b) There is an awareness that we are reaching dangerous limits in everyday behavioural patterns (diet, mobility, etc.).
- c) Environmental concerns in relation to great social and environmental impacts are no longer considered a consequence of accidents of various kinds, but rather the consequence of common behaviour by social agents (including companies).

In this context, companies, in particular small and medium-sized enterprises, face the challenge of growing competition boosted by advances in communication and modes of transport, while their customers and consumers have rising quality demands, and there is growing environmental and social awareness concerning companies' products and actions.

This is the challenge at the start of the 21st century. There is a growing sense of urgency.

In any case, the term "sustainable" is being attached to the term "growth" to describe the paradigm shift in states' and countries' behaviour. It would be strange to take the view that companies can carry on operating according to the same mindset as in the nineties in this new scenario of a sustainable economic policy.

This change in model is not a one-off thing, one decision you have to take and problem solved. Quite the opposite: the need for marked change in growth trends is an ongoing task, a constant and renewed search for sustainable conduct.

It is a matter of following a path towards a sustainable situation including the new knowledge that environmental research and studies will undoubtedly provide in the coming years.

The process of sustainability is the next step in raising awareness of the environmental factor. First of all, we need to stop seeing the environment as responsible for absorbing waste and as a source of materials and energy, and see it as a scarce good, a factor that must be efficiently managed with care in order to view government action as bringing together the environmental, economic and social factors in social agents' aims and policies.

The Brundtland report from 1987 is widely seen as the first milestone in this process, although it was not until 1992 that the term "sustainable development" took shape at the Rio Summit. After the Rio+5 Summit (1997), the fifth and sixth Environment Action Programmes of the European Community contained a commitment to draw up sustainable development strategies for the Rio+10 Summit (2002).

We are now in a situation in which the environment is not a factor considered in isolation.

Sustainable development highlights the interdependence of three vectors: economic, social and environmental. These three vectors should be taken into consideration simultaneously and in an integrated manner in companies' actions too.

Various works, mainly political-economic and environmental works, have given rise to a set of “principles” behind the concept of sustainability, which are set out below:

Sustainable development principles
1. The environment: the environment's ultimate physical capacity sets limits on many human activities and means that we must cut our consumption of resources. We must live within our planetary means in order to leave the planet to our descendants in a condition able to safely sustain human life.
2. Futurity: we have a moral duty to avoid compromising the ability of future generations to meet their needs.
3. Quality of life: human welfare has social, cultural, moral and spiritual dimensions, as well as material aspects.
4. Fairness: wealth, opportunities and responsibilities should be shared fairly between countries and the various social groups in each country, with special emphasis on the needs and rights of poor and marginalised groups.
5. The precautionary principle: if we are not sure of the environmental effects of any action or advance, we should follow this principle and act prudently.
6. Holistic thought: in order to solve a complex problem of sustainability, it is necessary for all of the factors that affect the problem to be included in the solution. (See: www.gencat.net)

The term “sustainability” is not a closed, static term, quite the contrary: it is a relatively new term that is in widespread use. It is a concept with much research being carried out into its development, which has implications for various knowledge areas. This means that, as progress is made with this research, the term “sustainability” will become more meaningful, and its scope will change.

The process associated with the term is as follows. The current level of sustainability can always be improved, since a balance between the economic, social and environmental sectors is struck by deciding not to max out the three vectors, as it has been observed that each sector cannot be maximised at the same time. Take for example maximum economic growth: this could use up physical resources, which would make growth of the other vectors, and even economic growth itself, infeasible.

Therefore, we will speak of levels of sustainability, which are relative depending on the areas, countries and situations involved. This is similar to what we do with regard to growth levels. The current vagueness of the term is partly due to the few tried and tested experiences. The research underway will provide new knowledge that should be applied at specific levels of sustainability.

By way of example, we should point out how advances in technological, IT and communication enable geographic and climatic matters to be studied from a point of view that was almost unheard of not so long ago. This viewpoint enables the appearance of new concepts and the reappraisal of more than a few existing concepts.

The vast amount of resources put into meteorological services was a pipe dream in the middle of the last century. The development of meteorological services, modelling capacity and improved prediction and communication of data, almost in real time (www.inm.es/web/infmet/satel/meteose.html), which all members of the public (or at least those with an internet connection) can access, is now a reality. There is nothing unusual about applying increasingly sophisticated techniques to preventing climate problems on the Mediterranean coast, and the growing possibility of precisely measuring risks to our planet.

The current challenge for the process of sustainability is making economic growth, which is intimately linked to technology and communication, compatible with caring for and protecting the environment, and striking a balance between this and a quality of life that is dignified, equitable and socially fair.

Companies play a key role in these action guidelines.

Sustainability involves integration, which in practice means a radical change from the traditional way of acting, in order to reformulate economic strategies from a more open point of view, both in the period of time under consideration, and the agents and interests being targeted.

Sustainable growth requires ambitious changes that bring about commercial flows of capital and technologies that are fairer and more equitable and more in tune with environmental needs. However, the most important task is finding the means to assert the right pressure to achieve a real process and develop a sense of urgency in putting this process of sustainable development in motion.

A sustainable growth model is the economic objective of efficiently allocating resources. Although it cannot all be left in the hands of economic calculation, it is also true that we cannot do without it. The environment has a value despite not having a market price.

Three basic objectives can be assigned to economic policy in order to efficiently manage the environment:

1. Resource use on an optimal scale in accordance with ecological regeneration capacities.
2. Fair distribution of resources and economically-efficient resource allocation.
3. Social consideration based on ethics and fairness.

Efficient allocation that includes environmental and social factors cannot be carried out through market mechanisms, unless it is possible to include social and environmental costs in the values used by markets and companies.

There is growing pressure for companies to internally recognise and consider environmental and social costs in their decisions and also in the information arising from them. This was pointed out in the Commission Recommendation of 30 May 2001 on the recognition, measurement and disclosure of environmental issues in the annual accounts and annual reports of companies (OJEC L156/33).

Efficient allocation by the market requires internal recognition of all of the costs of production, use and disposal of products, including the social and environmental costs, plus the income and profits arising from them.

The idea of environmental responsibility goes beyond the "polluter pays" principle. One possible way of viewing this was "we put a price on polluting and pay that price ... problem solved". The clear objective is to encourage prevention rather than redress (although that is important too). In environmental matters, prevention is clearly preferable. Environmental liability regulations are a clear example of this way of thinking.

Another source of pressure on companies is that they should greatly consider their relations with the environment.

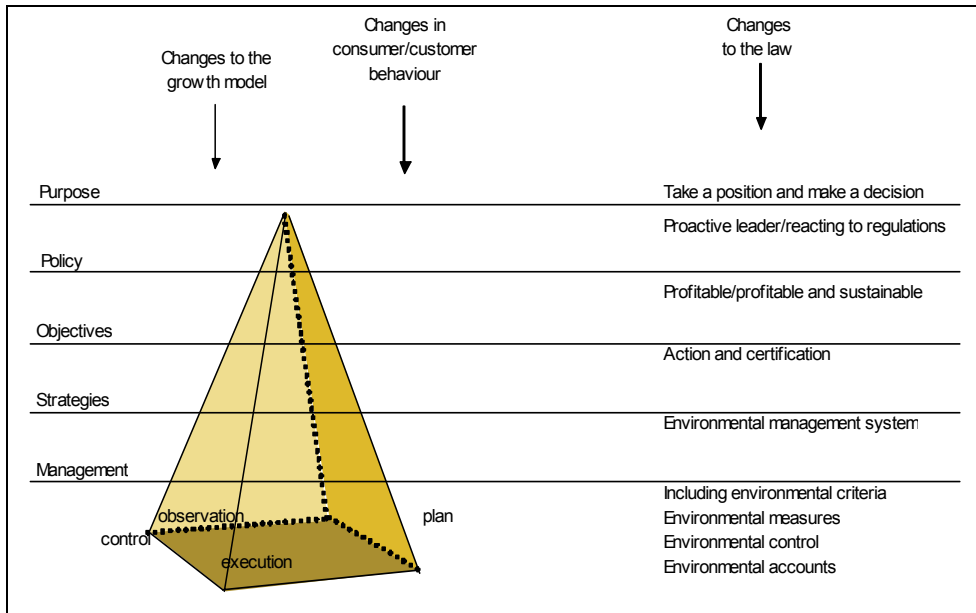
The need to grow in order to achieve full employment opens up another front, which concerns the dilemma of maintaining growth or lowering it for environmental reasons.

So the question is: would the lower job creation be offset by the employment generated by the new environmental business?

A new task for business: making employment possible in the environment.

The inclusion of environmental parameters creates new needs for people and products, so in economic terms we can speak of an environmental sector. As companies and organisations take more environmental variables into account in their projects, the sector will create more employment. Hence government policies and incentives aimed at encouraging and increasing incomes and working opportunities arising from environmental protection.

We have highlighted that sustainability involves making economic development, social development and environmental protection compatible with one another, striking a balance between them. This is a key challenge at the start of the 21st century. Companies face this challenge too. Contemporary companies also need to make an effort to work out the ideal strategy that creates added value by including the environment in their decision-making. This is illustrated in the table below:



Source: own data

As a result of this reflection, we need to include the variable of sustainability at all levels, from top to bottom, from the purpose (mission) to everyday management of the company.

This leads us to an overall objective: “including sustainability” at the core of companies’ behaviour.

This often results in the need for a system, an environmental management system (EMS) that makes it possible to manage sustainability.

Making “including sustainability” an objective is a decision that must be taken at the highest level of the company, since it arises from a new vision of the world and the company’s mission and applies at every level.

We do not see it as a vision involving an additional policy to be followed, but quite the opposite: it involves taking a factor - sustainability - into account in all existing policies and new projects.

This situation can be seen as a reformulation of the company in environmental terms.

It is not a matter of companies giving up their economic objectives and taking on environmental objectives; they are not incompatible with one another. Rather, it is a matter of using economic criteria to select environmentally-friendly objectives and also of including economic variables when dealing with the environmental options chosen by the company.

Companies play the leading role in this search for sustainability. We all realise that companies are able to exert influence over the rest of the agents in the market. They also need to introduce environmental and social criteria in order to gain a competitive advantage over their rivals.

1.3. HOW KNOWLEDGE MANAGEMENT CONTRIBUTES TO COMPANY MANAGEMENT

Knowledge management is not just a passing fad of greater or lesser importance. It involves considering a factor that businesspeople are well aware of: people's and organisations' knowledge. The best projects cannot be carried out without people and those people make decisions based on the information they have, appropriately drawn up and adapted to the company's policies and strategies.

Knowledge management emphasises the distinction between information and knowledge. It studies the way to convert information into applicable knowledge. We live in a world in which vast amounts of information are available, which makes the process of converting information into knowledge more important.

The human action and dynamics involved in creating knowledge can be interpreted as an economic activity, besides other ways. We can speak of knowledge production, viewing knowledge as an economic resource.

Knowledge is a resource used every day by economic agents to take all kinds of production, consumption and investment decisions. Knowledge production is part of the set of things that companies do. It is worth pointing out that knowledge is relevant insofar as it concerns the company's business. Knowledge is thus yet another business resource.

One can view economic analysis of knowledge as a resource of progressive importance, not limited to matters of production and marketing. Knowledge has become a good that is bought and sold; such knowledge is difficult to reproduce. Knowledge includes:

- The capabilities, ability, talent or skill that the labour force brings to the business.
- The economic agents' knowledge of production.
- The knowledge that workers and the company have of the market.
- The capacity for social interaction so as to know the features of an economic activity in depth.

This approach has clear repercussions on the form of studying and assessing the value of the company's human capital.

The change in the way knowledge is viewed goes hand-in-hand with changes in means of communication. ICT (information and communication technology) has a notable, two-fold impact:

1. It is a knowledge production tool: it is involved in improving processes, adapting demand and using fewer material resources in the economy. It may help break the link between economic growth and destruction of the environment.
2. It is a decision-making tool: ICT makes much more information available, allows it to be analysed from different points of view and provides complex calculation models. All this is very easy to communicate, and it is fast, so information can be obtained in real time. This provides companies with new capabilities to guarantee that decisions are taken with greater knowledge of environmental factors.

Knowledge has thus been identified that helps companies compete in the market that had hitherto been undervalued. It has value in itself and for companies, as it adds greater value to companies' projects.

Companies have this information, which is converted into knowledge. How best to measure and manage it is a question with a range of answers. These go from simple ignorance regarding measurement and estimation of its value, to behaviour in which that knowledge and, by extension, the people skilled in that knowledge, are the most valuable asset the company has.

Business is often reflected in the accounts provided by the company's accounting system, both internally and externally. In this context, the concept "knowledge" becomes an "intangible asset", which is seen as something of value to the company that it has not purchased (it would then have a

book value equal to the amount paid to acquire it). These intangible assets, which are often known as intellectual capital, are the result of applying information and knowledge to an organisation's productive activity. It comprises the explicit knowledge that generates economic value for companies.

Intangible assets can be the source of competitive advantages, to borrow the terminology from Porter's model. This makes them valuable assets, unsuited for being marketed and somewhat difficult for competitors to imitate.

1.4. THE ENVIRONMENT AND SUSTAINABILITY AS ELEMENTS OF KNOWLEDGE MANAGEMENT

The way in which intangible assets are treated in accounts reflects the way in which environmental assets are treated. One thing is for sure: accounting models fail to take them into consideration. Accountants put forward a set of reasons for this:

- a) Most users and some analysts of annual accounts do not have sufficient training to correctly interpret these figures. They make the accounts unclear.
- b) The absence of a rigorous assessment model and lack of experience means that they cannot be verified. They are not taken into account in current accounting principles.
- c) Computer software is not ready to extract and develop these figures.
- d) There is a need to preserve value and maintain confidentiality to prevent competitors from having information that would put the company's future at risk.

There is a close correlation between the two issues – knowledge and the environment – in relation to the way they are treated by financial analysts. It is no coincidence that companies treat the environmental effects of their products and processes and knowledge management in a similar way. This knowledge, this value, is becoming increasingly important for companies, since it is important for the public and other economic agents. One thing is for certain: the environmental impact of a company's actions does not just harm the environment. It also harms and damages the company's image and reputation, as well as its prestige. In our view, it is sufficiently important to be measured and managed.

The figure below, an environmental knowledge circle, shows the knowledge that a "standard" company in the last third of the 20th century may have had of how its business affected the environment.

Four parts are left out of the knowledge:

Company and average knowledge

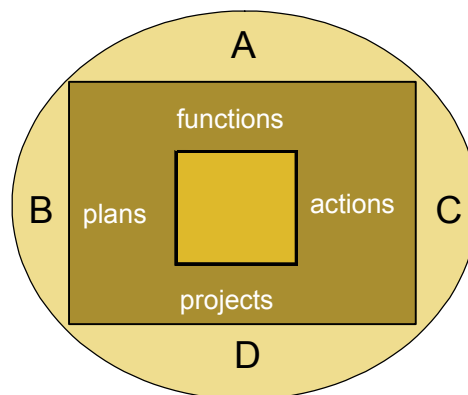


Figure A

- **A** Ignorance of the impact of the production process on the environment.
- **B** Ignorance of the impact of the use of energy and non-renewable factors.

- **C** Ignorance of waste.
- **D** Ignorance of the benefits of a sustainable attitude.

The path towards sustainability involves companies gaining better knowledge about the four above stages and progressively applying functions, actions, plans and communication and a control system to arrive at the situation shown in figure B, which includes knowledge of the environmental factors.

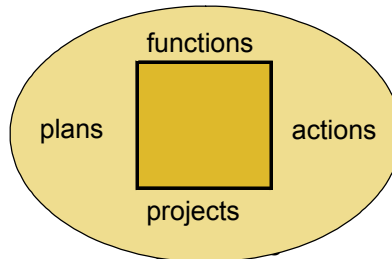


Figure B

The edges now have a different meaning, which shows a company's attitude beyond the scope of production and sales. We are referring to edges I, II, III and IV, which show a more diluted scope of environmental responsibility.

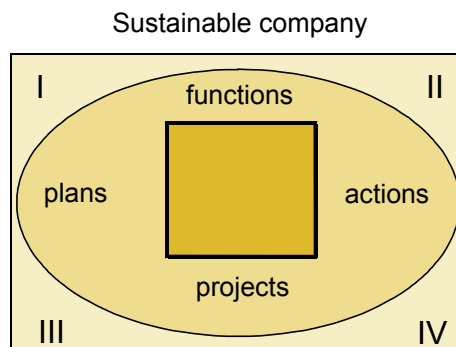


Figure C

These edges are sufficiently important aspects such as:

- I) Environmental impact of the use of the product manufactured and sold by the company.
- II) Impact arising from reusing the packaging of the end product.
- III) Impact arising from reusing the product.
- IV) Impact arising from replacing the product (once it has been reused as many times as it can be).

In other words, when the product is discarded and becomes waste.

Knowing the company's impact and the life-cycle of its products allows us to carry out an initial calculation to assess value creation:

$$D >< (A+B+C).$$

Knowing which aspects we are ignorant of, and then obviously finding them out, can become a new source of value for the company making these decisions, which improves its margins.

$$D-(A+B+C).$$

Depending on the degree of responsibility the company regards itself as having, or that it considers itself forced to accept, this calculation will be more complex and of a broader scope, as it includes the variables from the product's entire life-cycle:

$$D >< (A+B+C) +/- (I+II+III+IV).$$

In this expression, the values of the concepts shown in Roman numerals are the result of comparing the positive impacts and negative impacts of each of the knowledge areas described above.

We should point out that, on the road towards sustainability, this way of acting (internally recognising environmental costs, as well as the income arising from them) involves various stages:

- a) An economic calculation not including environmental considerations. We will not go into this here.
- b) A calculation considering the impact of the process of manufacturing and producing the product or service.

The idea is to minimise the impact. Action is taken once the process has finished (*end of the pipeline*).

- c) In more advanced stages, minimisation of the impact and reuse are taken into account in the production process, in which best practices are used. The production process may be rectified to make it more environmentally-friendly (redesigning the process).
- d) The vanguard (front-line): priority is given to studying the product, observing it over its useful lifetime and thereafter, so as to include aspects in the design of the product and the process that make the impact less harmful or actually beneficial (eco-design).

The *sustainability diamond* or *eco-compass* has become a widely-used way of showing these six variables and how they change in graphical terms.

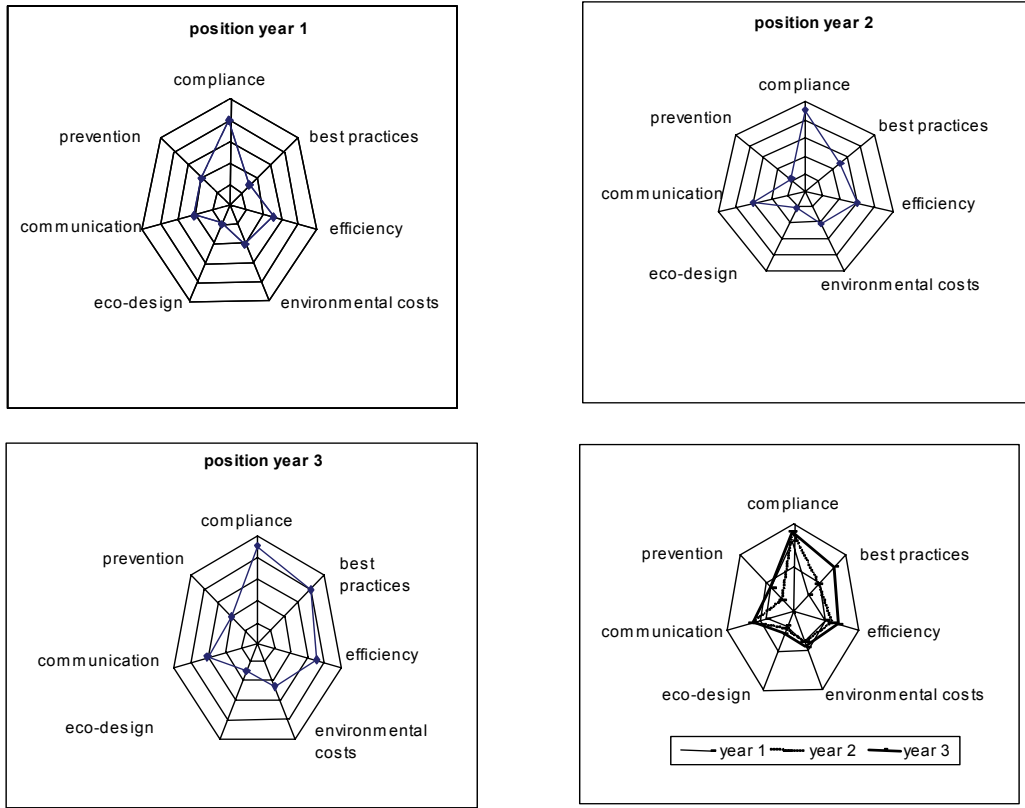
1. Intensity of materials.
2. Intensity of energy use.
3. Resources used in transport.
4. Waste, dumping.
5. Durability of the service.
6. Toxic substance content.

Companies can use the table of values to analyse their progress in the search for sustainability. It can be shown in the same figure using the following seven variables:

1. Compliance with regulations and fulfilling them in advance.
2. Following best practices.
3. Profitability and wealth creation.
4. Including environmental costs and benefits in the economic calculations of projects.
5. Eco-design of products.
6. Training and environmental communication.
7. Preventive measures.

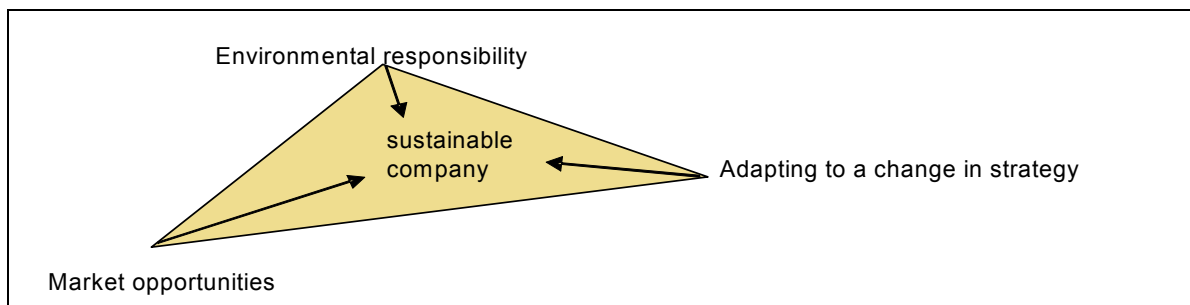
This graphical representation takes into account that changes in behaviour do not have to be homogeneous or constant over time. In some periods progress is made regarding best practice and in the next period there is a change in products' eco-design. That is where the figure comes in useful. Studying over time makes it possible to see the direction in which guidelines and company policies are moving.

This graphical way of showing the variables is particularly useful when considering a set of two past years (year 1 and year 2) and the forecast for a third year (year 3).



1.5. STUDYING THE OPPORTUNITY TO TAKE THE ENVIRONMENT INTO ACCOUNT IN A COMPANY'S GENERAL POLICY. COSTS AND BENEFITS

Several reasons have been identified for the need to have sustainable companies, i.e. companies in which sustainability is present at all levels. Realising the implications of a different setting is something that companies should take into account in setting their objectives and milestones. A good way to look at this change in setting is that it gives companies business ideas and pointers, an opportunity to take the lead or gain a significant position. Sustainability is a factor that can hand a company such a position.



In order to weigh up the pros and cons of this extremely important decision (introducing sustainability criteria), which it is difficult to go back on once the decision has been taken, one must assess the advantages and costs.

Let us go over some of the main arguments of the 6th Environment Action Programme:

VI. Programme:

"(...) Business must operate in a more eco-efficient way, in other words producing the same or more products with less input and less waste, and consumption patterns have to become more sustainable (...)" (page 3);

"(...) more progress was made in the implementation of environmental legislation in Member States. Integration of environment into the economic and social policies driving the pressures on the environment was improved and deepened.

(...) 2.3. Encouraging the Market to Work for the Environment. To date, the approach towards business has largely revolved around setting standards and targets and then ensuring companies comply with these standards" (page 15);

"(...) Markets and consumer demand can be guided towards products and services that are environmentally superior to competing products by means of information, education and by ensuring that products, as far as possible, incorporate the true environmental costs. This will encourage business to respond with innovations and management initiatives that will spur growth, profitability, competitiveness and job creation. It will also enable consumers to adopt greener lifestyles as informed choices" (page 16);

"Actions:

Encourage a wider uptake of the Community's Eco-Management and Audit Scheme (EMAS) and, in addition, develop measures to encourage a much greater proportion of companies to publish rigorous and independently verified environmental or sustainable development performance reports.

(...) Promotion of green procurement, with guidelines and a review of green procurement within the Community Institutions who will 'lead by example'" (page 19).

"(...) To help ensure that consumers are better informed about the processes and products in terms of their environmental impact:

- Encouraging the uptake of eco-labels that allow consumers to compare environmental performance between products of the same type;*
- Encouraging the use of reliable self-declared environmental claims and preventing misleading claims;*
- Promoting green procurement, while respecting Community competition rules and the internal market, with guide-lines on best practice and starting with a review of green procurement in Community Institutions..."*

It is true that there is a growing concern in economic policy to follow sustainable criteria and objectives. As part of this effort, companies tend to be pushed towards changing their attitudes to involve them in growth policies and sustainable behaviour. The box above contains sentences from section VI. Programme, which illustrate this change. Take for example the recommendation to promote green procurement. One could expect there to be an avalanche effect in the targeting of this if it were actively applied in our country.

Knowing the of extent environmental responsibility stipulated by the legislature, and the possibility of reducing the risk by covering it externally, directly affects companies as an aspect of risk in their policies. However, based on the foregoing, one can expect an expansion of the current concept of environmental risk for companies and the resulting assignment of the responsibilities involved. When they are seen in this way, the effects of environmental risk become increasingly important. They may even have financial implications, such as the following:

- a) An increase in possible environmental contingencies. More provisions or insurance costs to cover these broader risk areas.

- b) The accelerated ageing of technology for environmental reasons, which cuts the useful life of facilities and equipment below their technically-viable life when the environmental effect is included.

This effect requires more provisions for depreciation and therefore more costs.

- c) A need for new measures to correct impacts. More investment.

All of these have an indirect effect on the profit and loss account. It is good practice to revise financial information in order to appropriately "label" these items and ensure that the size of environmental costs is calculated independently.

Legal liability for damages of this kind that are caused is a necessary condition to make economic agents face the negative repercussions of their practices and activities on the environment. The legislature takes this stance in order to stress prevention when handling environmental factors, even when the cost of prevention is harder to calculate and put a figure on.

Finding out the cost of prevention and the possible cost of compensation for damages and contrasting them with the company's environmental risk is not merely an environmental exercise.

This question often requires financial audits, since leaving it out of the company's results could mean that it is undercapitalised and jeopardise it as a going concern (an accounting principle that auditors check compliance with).

The change of context provides companies with opportunities. Sustainable business development encourages value creation factors that involve an improvement in internal and external management of the company, together with lower economic and environmental costs.

Take just the following three for instance:

- a) It provides a new image, which drives a change in culture and mentality that affects all levels of the companies and is seen (and also spread) by customers and social agents.
- b) It becomes a policy that encourages better relations with employees, customers and suppliers, financial institutions and public authorities.
- c) It encourages technological improvements that involve better use of resources.

The fact of having rules for sustainability is a driving force behind innovation and leads the people involved in the company to creatively participate.

This matter is dealt with in chapter 4 of this manual, as well as in AECA document number 13, *Environmental management accounting*.

Opportunities for improvement

There is no doubt that environmental measures have often been seen as an extension of a company's quality control practices. If a company has successfully adopted and applied quality and accident prevention techniques, it can also tackle the challenge of taking sustainable variables into account with similar success.

When a company introduces policies for ongoing improvement of quality and the costs of the production process, assessing the appropriateness of investing in environmental prevention rather than just responding by redressing damage already caused is a further step in cutting costs and raising quality. A sustainability policy can thus be seen, at all levels, as an extension of the quality programme, even when it goes beyond the internal scope of the company's production.

Taking sustainable values into account involves including environmental concerns in the rest of the company's policies. This requires the use of a set of indicators to measure and express the company's behaviour in this area, in a similar manner to the requirement for more information for knowledge or quality management.

Improving environmental efficiency does not conflict with the company's growth, quite the opposite. The "factor four"¹ objective has a sufficiently clear economic basis: produce twice as much while using half the resources. The measure of this effort to produce an equal or greater amount of products while using fewer resources and creating less waste requires us to discover new knowledge, new measures often called eco-efficient, in order to assess the path followed in the process of trying to make the company sustainable. Getting hold of this information is a challenge for the company's information system.

Above we have looked at some changing aspects of the current situation that are putting pressure on companies to make their conduct sustainable and how this can be a source of competitiveness.

Now you need to look at questions concerning the implications all this has for your particular company. It is a cost/benefit assessment exercise in the form of a questionnaire presenting various different aspects for the reader to consider so as to then assess how important they are.

¹ FACTOR FOUR: A method of doubling production using half the resources

The questionnaire is as follows:

Questionnaire: IS IT WORTHWHILE?

		Degree to which it affects the company					
		Low			High		
		0	1	2	3	4	5
1.	The company is aware of the environmental regulations that apply to its processes and products.	0	1	2	3	4	5
2.	The company complies with all of the environmental regulations that apply to its processes and products.	0	1	2	3	4	5
3.	The company receives complaints about the environmental effect of the production process or the use of its products.	0	1	2	3	4	5
4.	The company's business depends on contracts with public authorities.	0	1	2	3	4	5
5.	The company's products have severe environmental effects.	0	1	2	3	4	5
6.	Accidents have taken place in the company's business that have significant environmental implications.	0	1	2	3	4	5
7.	Legal provisions limit the technical possibilities of its business.	0	1	2	3	4	5
8.	The business produces considerable amounts of waste.	0	1	2	3	4	5
9.	The business uses and produces hazardous waste.	0	1	2	3	4	5
10.	The production process has severe environmental effects.	0	1	2	3	4	5
11.	The production process significantly depends on natural resources.	0	1	2	3	4	5
12.	The company can guarantee that its waste is reused as much as possible.	0	1	2	3	4	5
13.	There is a quality improvement programme for the production process.	0	1	2	3	4	5
14.	There is sufficient cover to redress the damage in the event of environmental accidents.	0	1	2	3	4	5
15.	A significant proportion of the companies it sells to have environmental certification.	0	1	2	3	4	5

Assess the questions as follows:

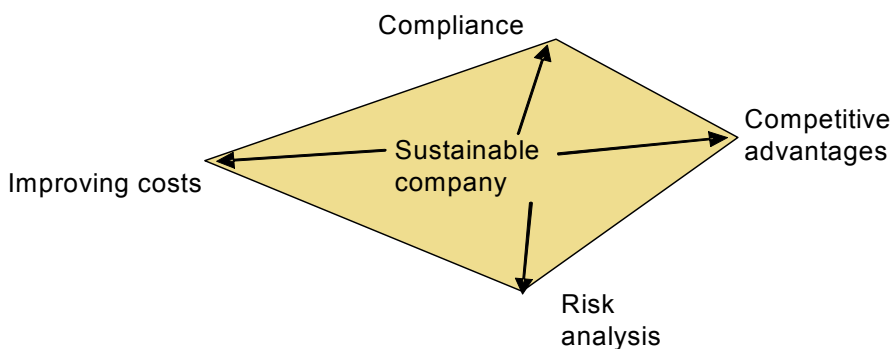
<p>Low (0): it is no problem for the company; it has the resources to deal with the matter.</p> <p>High (5): it is a risk factor for the company's medium-term survival; it has not been examined very much or insufficient resources have been made available.</p>

Although we will deal with it in greater detail in chapter two, for the moment we recommend taking a serious look at your company's environmental conduct if the total score is more than 30 points. The

knowledge your company will gain through such an examination will doubtlessly help reduce risks and costs and offset the cost of obtaining the information.

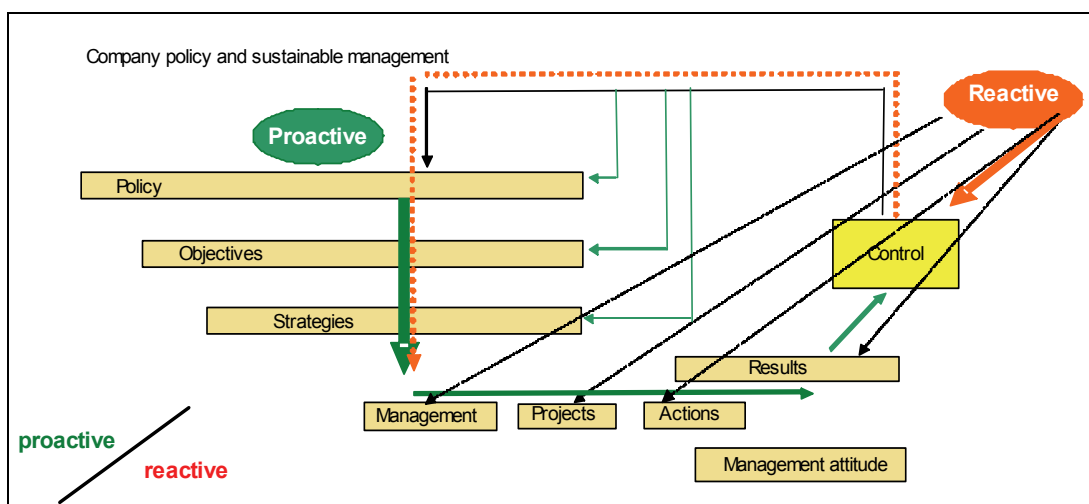
Sustainable development policies involve a change in the scenario in which a company acts, involving a set of consequences such as:

- Transformation of the competition structure, since new elements are included in the cost structure (environmental and social).
- Modifying customers' and suppliers' demands while introducing new assessment criteria. Raising customers' and suppliers' awareness about environmental conduct.
- Encouraging the modification of production systems and technological innovations that involve reducing pollutants and saving resources, especially non-renewable resources.
- Companies internally recognising these costs. It offers new business opportunities and is a challenge in terms of competitiveness.



Let us take a look at the attitudes one can take to the changing situation. Let us consider two extreme positions we could call proactive and reactive, respectively.

Generally speaking, they are different in terms of who takes the initiative in making sustainability a key part of the company's actions. A proactive attitude hands the initiative to the company, while a reactive attitude sees the inclusion of it as a response to what the legislature has imposed. The process and implications are set out in the following figure:



Source: own data

A proactive attitude goes one step beyond applying regulations. It undertakes, at the highest level, to decide to take every aspect of the sustainability process into consideration.

The highest management body outlines the environmental policy and makes it known so that the company can include it in its objectives and strategies and, all in all, in all of the actions managed with economic, technical, social and environmental criteria. The inclusion of these values is certain to result in new projects or remodelling of existing projects, which become company actions the results of which are known. Whether they are appropriate or not is checked by comparing them with the objectives previously set, through the monitoring and control functions involved in any business activity.

Sustainability is included in this way at the pace set by the company in the logical order from the most general scope to the specific field. The management staff will carry out this process, setting the pace and speed of the action (finding information, training staff, getting employees qualified, etc.).

The process is not without its difficulties. Finding out and putting new considerations into effect, studying the product's lifecycle and integrating specific policies with sustainability may lead to a situation in which they are not complementary but contradictory and you have to make a choice. This process requires sufficient time and investment in intangible assets and knowledge that may be significantly high.

On the other hand, this process is not controlled if you take a reactive attitude.

In this case you do not consider the environmental side until the regulations force you to. Until the regulations have come into effect and resources are provided to ensure they are complied with, the matter is not considered.

A reactive attitude sees sustainability problems as a technical problem. Management only gets involved in budgetary decisions and emergency situations, often as a result of accidents that have environmental impacts, in which the environment and sustainability are no longer a collateral effect but actually become a problem.

Not taking the initiative and leaving it up to the legislature means that the following two important aspects are not taken into account:

- a) It is not certain whether your company will have enough time to implement the stipulated conditions. It may also have difficulty finding sufficient resources.
- b) There is no guarantee that reactive action will allow you to follow the logical outline laid out by the general management for any kind of activity. More than likely, the legal change will affect conditions, strategies or actions unconnected to policies. To put it another way, it may not follow any particular business logic and make it harder for companies that take a reactive attitude.

If the differences between the two attitudes in terms of time are not reason enough, one also needs to assess the cost of the following:

P: Loss of income and costs required to adapt to the regulations when they are brought in, including the cost of redress if the action is the result of an accident.

C: Cost of prevention. This includes the costs of defining and implementing prevention policies in the broadest sense (avoidance measures; impact reduction measures; measures to take action and redress the impact).

G: The cost of competitors reaching a higher level of quality and a higher profile in terms of sustainability. This includes the effect on your company's image and the repercussions that has on your turnover.

The difference between "P" and "C" is the effect of applying regulations in advance, as a company with a proactive attitude would do.

The difference between values “G” and “C” puts a figure on the effect of having a competitive advantage over your competitors.

The contents of this chapter clearly suggest that it is necessary to take the variable of sustainability into consideration in order to improve the company’s ability to create value (and wealth).

Perhaps the decision that the company needs to take is: when should this process start?

It helps to see environmental responsibility as an urgent matter and realise that it is better if you are in control of the process yourself. So there is a clear answer to the question: **let’s get started now.**

The next concern is: how do you do it? The next chapter deals with this.

2. THE PROCESS OF INCORPORATING SUSTAINABILITY INTO COMPANY POLICY

2.1. INTRODUCTION

Society brings about changes in the guidelines that should be followed through the way in which it acts. Society now wishes to move towards sustainable development. Companies' conduct is being affected by this change in the direction of growth.

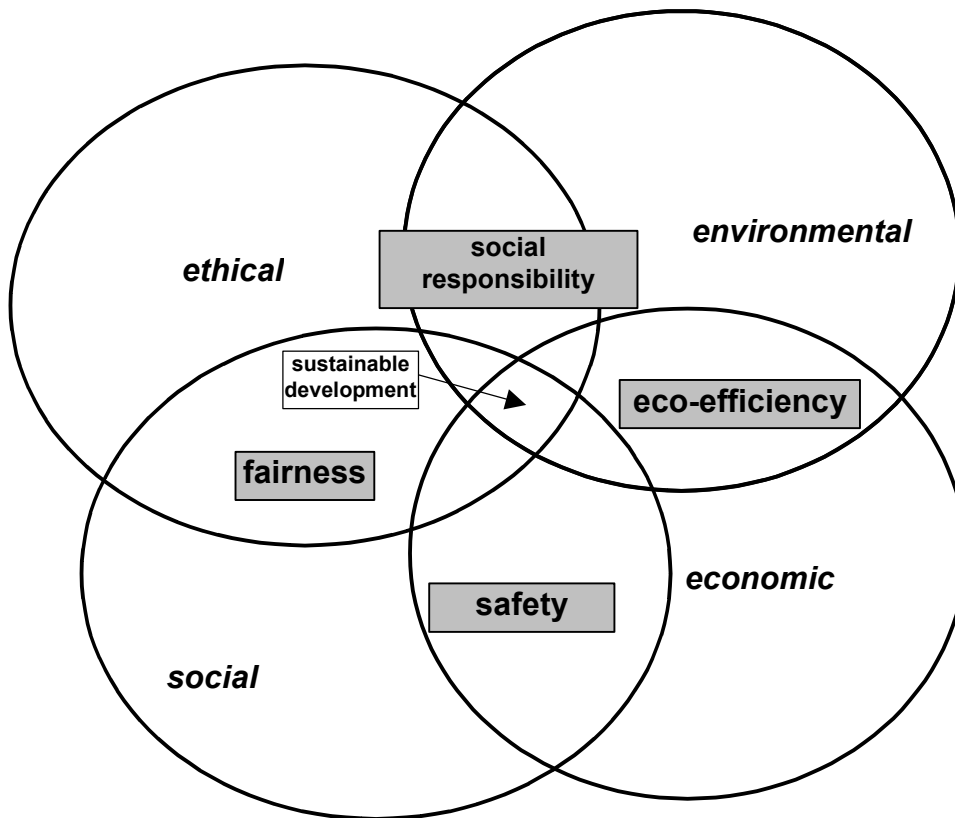
Generally speaking, sustainable development can be seen as one generation acting in a manner that does not compromise the actions of future generations, although it is more difficult to specify what this means in more operational terms. As far as economic policy is concerned, this involves taking three aspects into consideration (economic, social and environmental) which interact with one another on equal terms. For large companies, which are what economic policies tend to be significantly geared towards, it involves four-way integration: economic action, social action and environmental action, plus ethical and responsible conduct towards the various social groups, social representatives and stakeholders.

This ethical conduct is highlighted by two points:

1. The attention companies pay to explaining their behaviour. Matters concerning image and forming an opinion about the company's behaviour are treated as important. It is worth mentioning that there is a close link between image and opinion issues and growth in the company's share price.
2. The growth in the number of businesses and research centres that are drawing up codes of values, business ethics and conduct. Take for example the code of governance for sustainable companies produced by IESE, *Fundación Entorno* and PricewaterhouseCoopers (www.foroempresasostenible.org).

This code was a contribution to the Earth Charter (Johannesburg, 2002) in order to promote a European framework for Corporate Social Responsibility. In other words, it is a response from large companies to various pressures from society, despite being intended for "all Spanish companies including the subsidiaries of multinational companies, whatever their industry, size or circumstances".

For many companies it is a milestone at the end of a long path in which the environment is part of their long-term corporate strategy. This remoteness of this milestone stands in contrast to the immediate effects of intersections between these matters: corporate social responsibility, fairness, eco-efficiency and safety.



2.2. REASONS AND DIFFICULTIES TO TAKE INTO CONSIDERATION IN THE PROPOSAL FOR MAKING YOUR COMPANY GREENER. COSTS AND BENEFITS.

In chapter one we saw how changes in the setting they operate in are putting pressure on companies (of all kinds) to change their conventional attitude in an effort to take advantage of the innovative drive of business to take society along the path of sustainable growth. Business success is also measured in environmental terms; this does not reduce the need for firm economic action, but rather means that companies should gear their targets towards increasing responsibility.

Analysis of the changes determines the path to be followed and guides the company's response.

At the end of the 20th century, the coming together of information and communication technology (ICT) and the feeling of globalisation, among other factors, have made three changes possible, which are of use in planning the path to take:

- a) It makes company-related activity faster and broader in scope, particularly with regard to corporate relations and the environment. New ways of communicating and organising opinion formers are emerging. Global, transparent communication is taking place and image is of prime importance. Crises arising from environmental accidents strike almost immediately.

There are crises of trust and credibility.

- b) Legal effectiveness is growing due to improved regulations and greater compliance in larger portions of the globe. New matters are arising such as extending responsibility to the supply

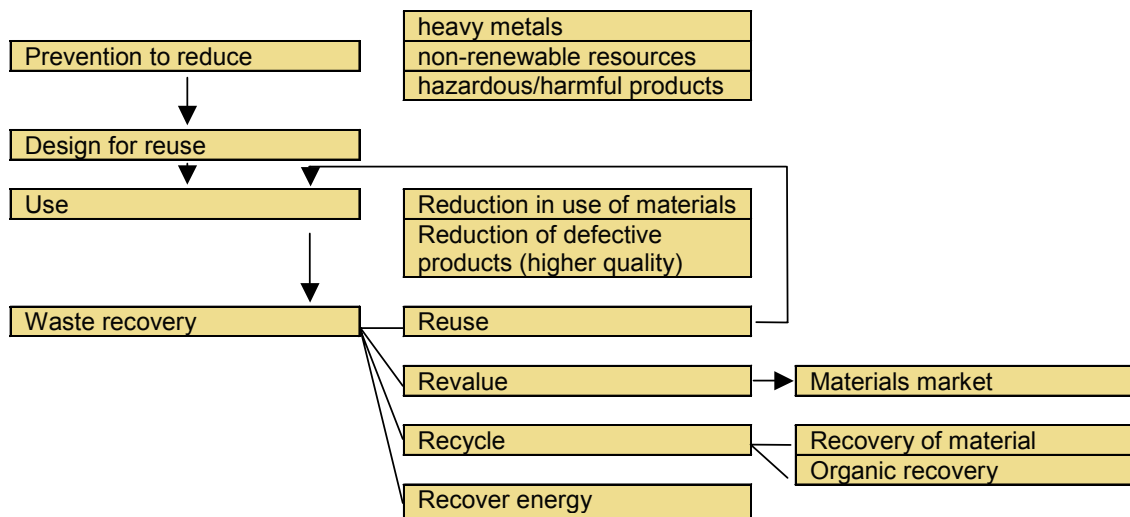
chain (*upstream*) and to the conduct of distributors and customers in the use of the product and packaging (*downstream*).

- c) There is an increase in requests for information about products' environmental behaviour, composition and how they affect the physical environment. This also applies, to a growing extent, to the form of production and the environmental implications of the product's production and distribution process. We now know that failing to inform opens the door (or internet portal) for others to do the informing instead.

The action expected from companies is more complex. The concepts of reuse, revalue and reduce at source (reduce use of materials), the three Rs, are becoming increasingly relevant. This involves reengineering the company's business. In the case of packaging, the pressure exerted has led to the development and application of various UNE standards with two intentions: firstly, standardising the identification and terminology used in described business activity, and, secondly, and no less importantly, establishing a defence mechanism that makes it possible for companies to explain there is a rapidly growing need for certification.

Companies' production work is being changed by the inclusion of treatment of packaging and industrial waste.

The following terms are becoming increasingly important: revaluation, recycling, limiting the content of heavy metals and harmful substances, information system, waste and packaging.



Stages of intervention in the lifecycle of a company's product

One should bear in mind that the responsibility for packaging lies with the company. The company is responsible for the packaging it puts on the market with its products. It also responsible if it is not the producer (e.g. an importer). If that is the case for packaging, then what about the product itself?

Let us leave general considerations to one side, as we can all agree on them and surely add new arguments, and move on to a more specific, personal analysis.

More personal in two senses: your perception and your unique situation.

Perception in the sense that although the aspect of environmental action is described in terms of growth, strategy and the future, it is ultimately a long-term problem that we often lose sight of as it is blocked out by immediate responses. We need to be aware that the future starts today for all of us.

Where am I? Where are my current competitors? These questions frequently kick off the search for sustainability.

Unique situation. The whole matter of sustainability and being environmentally-friendly is all very well and good for global companies that have a lot of influence, but what about me? What can a small company do about sustainability?

- Prevent to reduce.
- Design for reuse.
- Use.
- Recover waste.
- Materials market.
- Recover material.
- Organic recovery.
- Reuse.
- Revalue.
- Recycle.
- Recover energy.
- Heavy metals.
- Non-renewable resources.
- Hazardous/harmful products.
- Reduce the amount of materials used.
- Reduce defects (higher quality).

It goes without saying that the authors' position requires small companies to be greatly involved as the driving force behind a sustainable development strategy, but we are also convinced that it is necessary for the medium-term and possibly short-term survival of small companies themselves.

So as to avoid gathering empirical proof, with the cost this could involve (which could drive the company out of business), we will employ a set of four arguments for small companies to act sustainably (not in order of importance).

- a) Liability for (environmental) damage is proportionate to the damage caused not the company's size. Size is not regarded as a mitigating circumstance either.
- b) There is clear evidence that companies in our country are starting to value sustainability. A "code of governance for sustainable companies" has even been drawn up. It is not just these pioneering companies that will reap the costs (and benefits) this involves. The process envisaged is very similar to the path followed to control quality (green purchasing standard).
- c) When one analyses the sustainability process that a company might start, it soon becomes very clear and evident that the path that needs to be followed inevitably involves extending compliance with sustainability variables to the supply chain (*upstream*) and also to companies involved in the product's life-cycle, i.e. distributors, maintenance companies, users and recoverers, among others (*downstream*).

What do my customers think of this matter?

- d) Due to the matters that concern them, the public authorities are generally ahead of most companies when it comes to defining, studying and carrying out action aimed at sustainability (agenda 21, action plans, etc.).

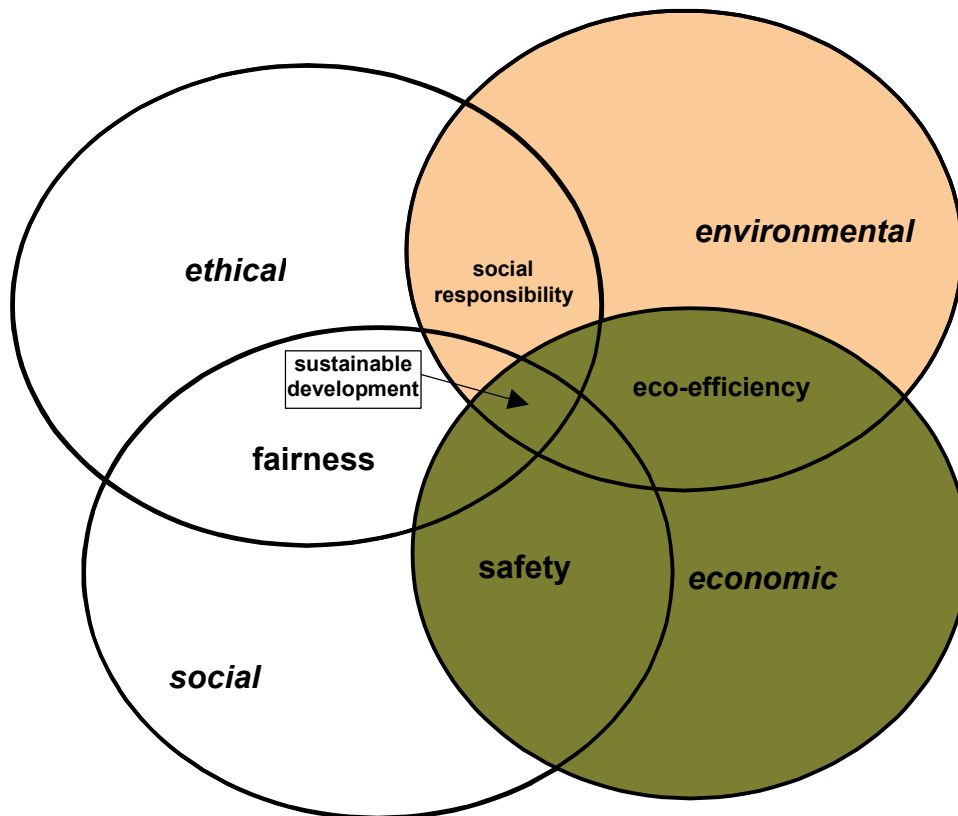
There are two sides to their conduct and influence. On the one hand they lay down the regulations, and on the other, they are the receivers (customers) of products and services.

How does the number of recognised points in the company's environmental behaviour change when it is recognised as an authorised supplier for public authorities or projects?

This is undoubtedly a matter we need to look further at. It provides a good indication of the change in the company's environmental perception.

The answers to these questions lead on to the financial impact of the environment, as could hardly be otherwise due to the interrelation of the aspects involved in sustainability: economic, environmental, social and ethical aspects.

Let us focus on the environmental part. Its influence is unquestionable, at least from a reactive point of view. Its influence can be seen to different extents by a company or its industry. It takes the form of a growing degree of interest in environmental matters alongside changes in the economic strategy of public authorities and companies.



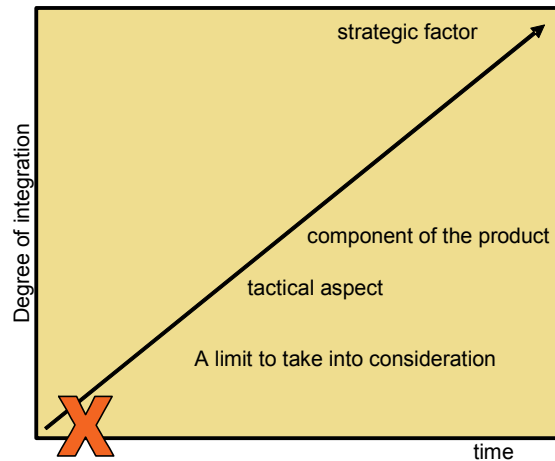
The tourism industry is a clear example of this change. The industry has moved from a period of completely ignoring the environment to considering it a strategic factor in company policy.

The environment as a factor was simply not taken into account in the sixties, when growth (the number of tourists) was the leading and almost only measure. Decades later the environment is seen as an aspect that restricts growth (there is not enough room for everything). The environmental impact is also considered a restriction on company and public policy (problems with peak demand for water, the quality of beaches, access roads, etc.). Both companies and the public authorities take this situation into account in their policies. A clear example of this is the paradigmatic case of Calvià, which bases its planning on sustainability (Agenda 21). This tourism company responds proactively and includes the environment as part of its product; it sells the environment, rural tourism and green tourism, etc.

Companies are being set up in response to this concern in society. The tourism industry is not an isolated case.

The change in conduct involves four stages, taking two factors into account: time and the extent to which companies internally recognise environmental values. These stages are as follows:

- a) Feeling that the environment is a limit that needs to be taken into consideration in business.
- b) It is a component that needs to be considered in tactical terms, which is involved in production (production of emissions, effluent, etc.).
- c) A component of the business or product (associating environmental factors with the product or service being marketed).
- d) A strategic factor for the company (it is involved in all of the company's policies).



At the base or start of this ascending line of involvement in the company there is often an accident, a crisis concerning the environment, the physical system, which clearly exposes its limits. This leads to the following question: is it necessary to wait for an accident to happen to start the process of environmental involvement?

As one can easily see, not all companies have taken the same action to the same extent. Companies' responses to change come under two extreme classifications: early (proactive) and defensive (reactive).

The defensive attitude tends to assume there will be more costs than benefits and relies on the costs having the same effect on the rest of its competitors, so they will thus be able to pass the costs on by raising the product's cost.

Under regulatory pressure, the company takes action to reduce its impact and makes investment to achieve compliance levels. It takes partial action, which is always conditioned by the appropriateness of the regulations, which tend to take a more overall view. There are also situations in which there are no regulations to guide how to deal with environmental problems.

Defensive attitude		
Style	Perception of the problem	Result
Action is based on complying with the law	<ul style="list-style-type: none"> Acting resulting in the activity performed. 	<ul style="list-style-type: none"> New investment.
	<ul style="list-style-type: none"> Technology from the end of the pipeline. 	<ul style="list-style-type: none"> The cost of reaching the required level.
	<ul style="list-style-type: none"> Redress for damages 	<ul style="list-style-type: none"> Fall in commercial margins
		<ul style="list-style-type: none"> Reduction in risk of being fined.

However, a very different attitude may be taken. A company may have a vocation to act early, to prevent, to go beyond the legal minimums, by foreseeing stricter and more technologically advanced regulations. It may see there is an opportunity to put up a barrier, a strategic difference that enables it to improve its economic performance.

A company that sees the environment as a source of differentiation takes measures to promote innovation and includes environmental considerations in its positions and policies.

It uses the greenest technologies, makes better use of resources and takes positions that are difficult to measure, intangible assets, which indirectly affect economic results. We are referring to intangible assets such as the image of a sustainable company, harmonious relations with suppliers and staff, better communication and the involvement of social agents.

Anticipatory attitude		
Style	Perception of the problem	Result
Anticipating the impact and problems.	<ul style="list-style-type: none"> In addition to achieving results, it emphasizes preventive action. 	<ul style="list-style-type: none"> An image of prestige and environmental respect.
It also anticipates regulations. Including the environment in the company's policies.	<ul style="list-style-type: none"> Establishing channels for publicising environmental activities. 	<ul style="list-style-type: none"> Competitive advantages Access to new markets.
	<ul style="list-style-type: none"> It changes the entire company's culture. 	<ul style="list-style-type: none"> Technological improvement.
	<ul style="list-style-type: none"> It involves every level of the company. 	<ul style="list-style-type: none"> Environmental management costs.
		<ul style="list-style-type: none"> Benefits of environmental action.
		<ul style="list-style-type: none"> Harmonious relations with social partners.

That is what environmental action in a company means, rather than just responding when the damage has already taken place. The need to involve environmental matters in company management requires the environment to be considered a factor of production or an element to be considered in relation to the impact it may have. The environment becomes an integral part of the company's strategic planning, organisational structure and business operations.

Considering these aspects early, in a proactive way, is becoming more and more common. An ever-increasing number of companies have adopted an environmental policy and environmental management, as well as different ISO standards, EMA and other tools that lead to integration with other management systems, making it possible to take joint decisions, put environmental flows into

effect and monitor them. They have taken other decisions related to the foregoing measures, such as cutting operating costs and improving production safety and quality.

How do you take anticipatory action?

You should start by considering whether it is worth starting a process that is not easy and involves still more work if you go back on it. You have to get involved in making commitments, acting in consequence and explaining to your partners the change in attitude, and the corresponding progress and setbacks, which will grow in number and diversity as the difficulties of finding them out grow (see chapter 4).

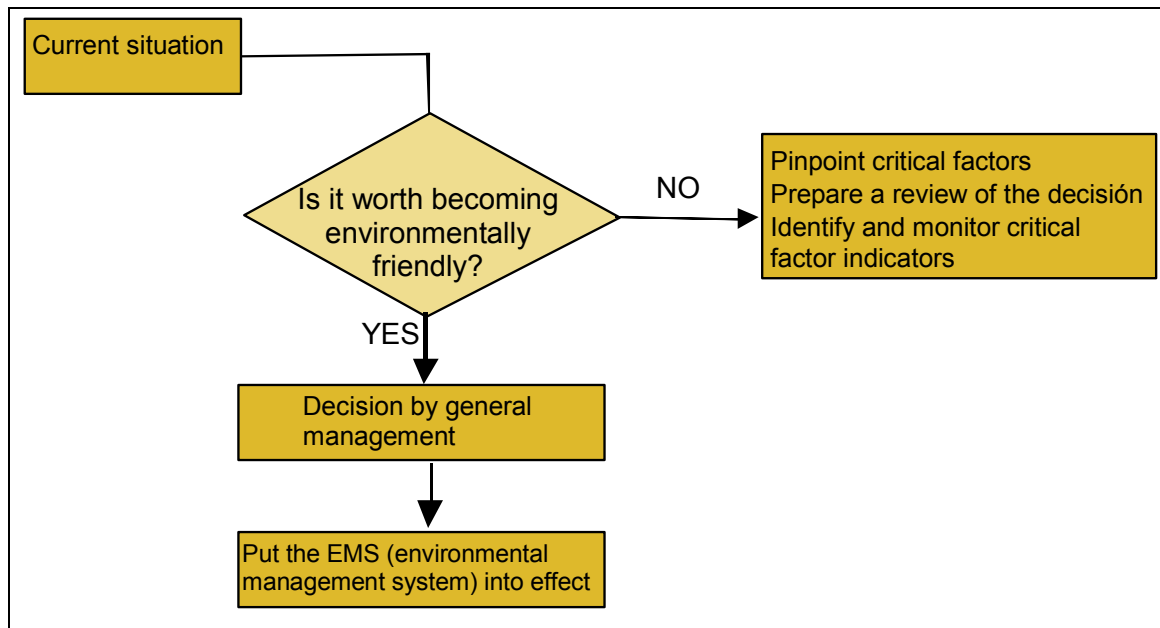
The anticipatory attitude involves taking committed decisions; the main ones are as follows:

- Establishing a code of ethics setting out the organisation's environmental responsibilities, which are shared and agreed on in a participatory manner.
- Making realistic personal commitments, which can be undertaken and achieved.
- Setting environmental priorities.
- Establishing an environmental management system integrated with other company management systems. Setting monitoring indicators.
- Establishing a training plan and raising awareness of it among the entire company.
- Introducing ongoing environmental information, training and collaboration systems.
- Ongoing improvement of environmental management.

Including it in the heart of the company's daily activity in this way is not free of difficulties. First of all, it is worth pointing out the difficulty of deciding. An environmental commitment may benefit from a delay, but once the process has begun, it is hard to go back. Four dangers can lead to failure in diagnosing this decision, which should be borne in mind:

- Short-term interests may take priority over the long-term direction.
- There is no vision that provides a clear view of the consequences of continuing to carry out unsustainable practices.
- The lack of available options for action due to private interests.
- The difficulty of tackling problems of distribution and fairness.

The decision to be taken is set out in the figure below:



Businesspeople are considering the need to start the process of incorporating environmental variables in their company policy, at all levels, in terms such as “making the company environmentally friendly”. If the answer to the question is negative, it is worth pinpointing the factors or grounds for that decision and plan to review the matter in the future.

It is also a sensible attitude to pinpoint the variables outside of the company’s control (variables arising from the company’s setting) which have affected the decision. Once these variables are identified, they should be associated with indicators. One should then look at implementing a system to monitor these indicators so that changes in them that could affect the decision can be detected and the businessperson informed in good time, so as to change the strategic decision made previously.

If the businessperson decides to take action, he/she needs to start with a decision taken at the company’s highest hierarchical level. The process of becoming more environmentally friendly is a process that involves the company’s entire structure and requires support from the very highest management level.

Putting this process into practice requires the environmental management system we will comment on in the next section to be put into effect. It is time to weigh up the pros and cons of this decision, to start off along the path. Below we will list the key factors in the company’s attitude and any effects on its operating accounts.

Explaining the relationship between them involves just that: relating the two areas with one another, but under no circumstances should one be seen as subordinate to the other and the environment should certainly not be seen as subordinate to economic calculations.

The efforts made by various companies to become more environmentally friendly have had various beneficial effects on the companies, which we have grouped into five categories:

- Savings.
- Market position and business opportunities.
- Product quality.
- Safety.
- Image and other intangible assets.

These are ordered from highest to least tangible. Below they are listed in greater detail so that readers can appreciate how they apply to their situations.

Financial/economic impact of environmental management			
Beneficial effects	Action	Effect on profit and loss accounts	
		Costs	Benefits
Savings.	Reduction at source.Reduction in use of materials		Fewer materials consumed. Lower management costs. Lower warehousing cost to finance.
	Reuse.	Shorter useful life of pre-existing equipment	Lower consumption.
	Minimising waste.	New investment in equipment.	Lower waste management costs.Savings on consumption.
Market position and business opportunities.	Recycling to obtain new materials.	Training costs.	New markets. New income.
	New uses for waste.	Environmental management costs.	Lower waste cost
			Lower consumption. Lower impact (lower cost of redress).
Product quality.	New technologies.	Substituting materials.	Access to more demanding markets.
			Higher prices.
			Developing new technologies.
Safety.	Change of the entire organisation's mentality.	Capacity-building costs.	Lower accident rate.
			Lower risks of using the product.
			Higher productivity.
			Lower risk premiums.
			Lower interest rate.
			Access to ethical financing funds.
Image and other intangibles.		Resistance to change.	Improved image.
		Environmental communication costs.	Long-term vision of the company.
			Harmonious relationship with social partners.

It is up to the reader to take the initiative.

It would certainly be good to be able to answer these questions as part of the decision-making process.

A positive answer to this wide-ranging approach to the question “Is it worthwhile?” leads one to put two quality or ongoing improvement cycles in place, which are based on the company’s environmental commitment statement (see section 2.3).

This statement also gives rise to the setting up of environmental planning (defining the environmental policy, setting goals and drawing up action programmes) which is applied throughout the organisation and is part of the company’s everyday activity. It is also measured with the relevant indicators and the degree of compliance (deviations) is assessed in relation to the initial planning. This process is reviewed and makes it possible to carry on with planning the next period.

System auditing also makes it possible to assess how the data are communicated through environmental reports (and sustainability reports later on) that are aimed at informing society. It is good for a company to know how its environmental action is seen, so that it can alter its environmental statement when necessary.

In our opinion, the need to manage the environmental variables in the company’s business is more a question of time than a question of what the company wants. One cannot do without such management.

Moving from the question “**Is it worthwhile?**” to “**When should environmental and social aspects be incorporated into company management?**” is just a matter of time and attitude (proactive or reactive). It is advisable to be aware of the stages that await you on the path towards sustainability, in relation to the aspects you are now considering as environmental variables in company policy. The next section deals with this.

2.3. ENVIRONMENTAL COMMITMENT STATEMENT

An environmental commitment statement has two purposes: on the one hand, it is the result of examining the company’s current situation in terms of environmental practices and values and, on the other hand, it is the starting point for an environmental management system.

In the previous section, we set out the costs and benefits to bear in mind in deciding whether or not to take the environment in account in the company’s policy, together with a set of questions related to the company’s environmental situation. After considering these, businesspeople who decide to include the environment in their company’s strategy enter a stage in which two very important documents are produced: the environmental commitment and the environmental policy.

The company’s effectiveness and efficiency is always measured in terms of specific results, which are directly related to competitiveness and productivity objectives and indicators. It is management of these activities that allows us to supervise and control these values. The company has a management system with these aims in mind and also an information system that allows it to find out information useful in managing it, as well as to make the company’s progress and situation known to groups interested in the company’s management. This is the purpose of the company’s annual reports and accounts (which must be filed with the Companies Registry).

The incorporation of environmental values in measuring the company’s activities involves the inclusion of environmental values in the internal and external information and management system. These elements are part of the environmental management system. It is also necessary to determine its scope, because unlike the financial field, where the purpose is indisputably to “create value”, companies’ environmental purposes are nowhere near as clearly outlined and widely accepted. Hence the need to have a reference point to refer the company’s decision to.

This reference point is the environmental commitment, which is set out in a document intended to be widely read and show the level of consideration given to the environment in the company.

Two aspects should separately be highlighted: the need to have an environmental commitment and the need to make it known and also to have it certified.

The reason why it is worth having one is closely related to the way in which one views the company's management. Although it is true that if you do not measure it you will not achieve it, one can also say that, if an objective is to be achieved, it must be defined and made known among the organisation. It is indisputably worth doing; we will deal with the usefulness of certifying the process later.

Integrated management does not just supervise and control, but also enables improvement of the objectives sought. Environmental management is not a system that exists in isolation from the others; quite the opposite. The more integrated management is, the more visible its results are, since greater effectiveness and efficiency are achieved through people's efforts, thus culminating in the process of integrating the three areas of sustainable development (environmental, social and economic areas) in management.

The starting point for putting an environmental policy, and therefore an environmental management system (EMS) into effect in a company is for the company management to be committed to establishing an environmental policy.

There are three aspects to this commitment:

1. Compliance with environmental regulations.
2. Preventing the environmental impact its activities, products and services may cause.
3. Starting a process of ongoing improvement of environmental aspects.

Acceptance of the commitment by the company's management allows it to reflect on the matter based on three questions:

- a) **Why?** Both acceptance of awareness of ethical values and the adoption of sustainable criteria, as well as setting clear boundaries for the company's environmental responsibility.
- b) **Why not?** If the analysis of the current situation concerning the costs and benefits of an environmental attitude convinces one to put an environmental management system in place that enables eco-efficiency and of greater value to the company.

If something is environmentally friendly, it is often also profitable in accounting terms. It will always be worthwhile in terms of the environmental result of the company's business.

Adopting policies aimed at sustainability makes it possible to adopt business management tools that improve the company's internal and external management, which cuts economic and environmental costs. This is clear to see in procurement savings due to reduction in use of materials or a reduction in the accident rate from use of the product. This is true even when there are very different difficulties in classifying them and pinpointing their causes.

- c) **For whom?** Two **contexts**: external and internal.

The **external** context, concerning all of the groups that exert pressure on the company's conduct.

The environmental commitment is a response by the company to pressure from:

- i) The public authorities. The introduction of directives is leading to stricter and more restrictive legislation, which is increasingly demanding in relation to both penalties and the extent of liability (extension of liability to use of the product and packaging).

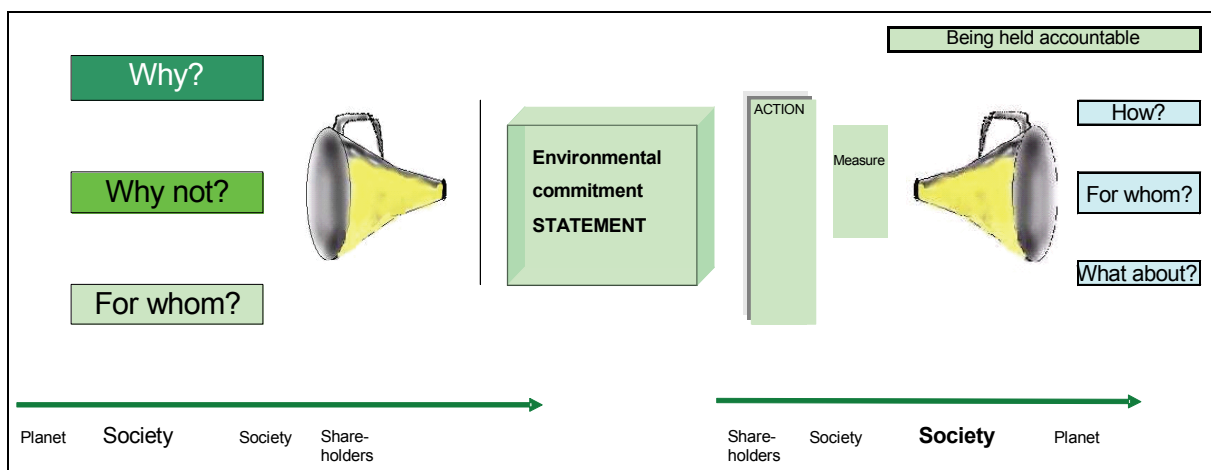
- ii) Related companies (customers, suppliers) which are also involved in sustainability programmes. Achieving milestones of improved environmental and (sustainable conduct) involves having suppliers, distributors and customers with programmes and actions to raise environmental awareness.
- iii) Consumers. Raising the awareness of customers and consumers leads to the handling of an increasing amount of information about the product's environmental behaviour and the waste treatment and manufacturing conditions.
- iv) Workers. As far as staff are concerned, steps that make the company more environmentally friendly and increase safety go hand-in-hand with the idea of quality of life.
- v) Financial agents. Reducing environmental risks is a source of value for shareholders. How a company is considered in environmental terms, often through certification, is the key to accessing financing from ethical or green funds.
- vi) Competitors. Bringing in environmentally-friendly technologies and products is a barrier to competition for companies. Competitors know this too.

The **internal** context, as regards management. A reference point is needed to examine all of the everyday problems and is also necessary for strategic decisions.

This reference point is the environmental commitment and the definitions of environmental policies arising from it.

To sum up: these aspects make a company's environmental commitment the basis for defining its policies and the reference point that the company gives society about the position it takes regarding social groups' expectations, which is why it is published and made known.

It becomes the central reference point for the company's environmental communication.



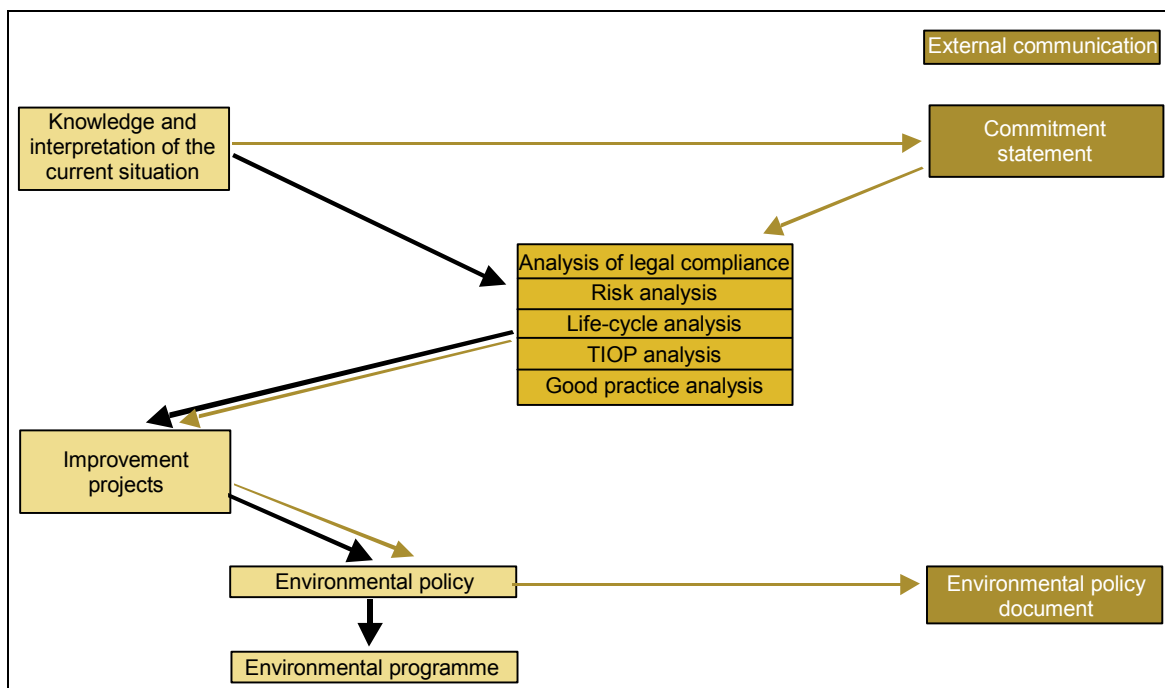
This document arises from the statement of figures and problems that are outside of the company's decision-making sphere and the pressure exerted by the various social agents to solve the problems. It comes in response to the expectations people have of the company. We will return to these three aspects (state, pressure, response) in chapter 4. It is the thread that binds together the groups of indicators for the company's actions.

The document that contains the environmental commitment statement is a document that may be read by very different audiences and must have the following qualities:

- A single statement. Statement of intent concerning the environment and sustainability.

- Far-reaching, yet sufficiently general so as to avoid the need for constant amendments. Permanent.
- Concise and clear. It must not leave any doubt as to the company being sustainability-oriented.
- Reasoned. It explains the reasons for following environmental criteria.
- Substantiated. It refers to knowledge of environmental, cultural, social and economic values.
- Communicated. The entire company is informed and it is made public.

The communication and publication of the environmental statement shows that the company is committed and that the commitments have been made to be fulfilled, as well as to explain their fulfilment through environmental and sustainability reports (see chapter 4). The risk of non-compliance is an aspect that needs to be weighed up. This leads to two models for drawing up environmental policy according to the levels of transparency the company decides on. The two paths are shown in the figure below. The light line shows the stages a transparent company goes through and the dark line shows internal implementation.



It is worth mentioning that it is possible (and advisable) to go from one situation to another, so that the order in which analysis of compliance and risks, etc. and the environmental statement are carried out is open to both possibilities.

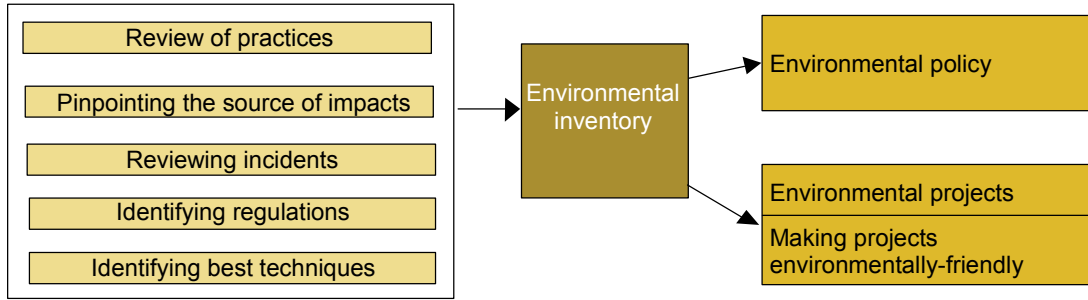
It would clearly be prudent to study the scope of this commitment before undertaking a commitment.

In any case, you need to examine how to carry out the study of the current situation (section 2.4) and the instruments that make it possible (section 2.6).

2.4. SYSTEMATIC REALISATION OF YOUR COMPANY'S ENVIRONMENTAL STARTING POINT. WHAT POINT ARE YOU AT?

Once a company has decided to make an environmental commitment, whether or not it has been made public, it is necessary to find out your starting point; i.e. describe the behaviour and current interrelation between the company and environmental factors. The company needs to know the strengths and weaknesses of its operations with regard to the environment. This process has often been labelled an environmental audit, when it is actually more an inventory of real or possible

problems in the company's situation in relation to the following matters: occupation, land, resources (non-renewable), waste, atmospheric emissions, water, noise and energy.



The purpose of this environmental inventory is to:

- Find out the company's environmental conduct.
- Analyse the cause of the problems.
- Pinpoint areas in which corrective measures should be carried out.
- Improve the company's management and increase the eco-efficiency of the process.
- Improve the eco-efficiency of products' design.

The data provided by the environmental inventory is analysed to assess the environmental management and concerns the environmental sides of a production process. The environmental impacts are thus grouped according to their potential relationship with a specific environmental vector, and are assessed according to their actual effect on the problem.

Detecting problems							
Problem no. x	People responsible	Action	Solutions	Term	Urgency	Environmental importance	Cost
Water aspect							
Waste aspect							
Energy aspect							
Emissions aspect							
Noise aspect							
Land aspect							

The EMS rules contain a list of different aspects (possible problems) that need to be considered. They notably include the following:

Energy management
Amount and type of energy consumed.
Ways to reduce energy consumption.
Ways of using renewable or less harmful energy sources.
Materials and goods
The effects that products and components have on the environment.
Selecting and managing environmentally correct materials.
Using and disposing of non-reusable finished products.
Waste recovery. Revaluation.
Transport and storage methods.
Packaging: amount, type and materials they are made of.
Waste disposal
Effects of handling, storing and transporting waste.
Reduction in disposal of waste.
Recovery, reuse and recycling of materials.
Atmospheric and water emissions
Reduction and elimination, as far as possible.
Recovery, reuse and recycling.
Noise
Reducing the levels of noise inside and outside of the centre.
Noise produced by the production process.
Potential effects of new processes or changes to existing processes.
Including environmental criteria in the decision-making process.
Suppliers
Environmental action by suppliers, contractors and subcontractors.
Ways of influencing and monitoring their environmental action.
Accidents
Potential effects of environmental accidents.
Prevention and limitation plans.
Contingency plans for subsequent recovery.
External information
The need to provide information about the effects and actions.

Detecting a problem is the first step in managing it, followed by producing alternative measures and finding out their environmental and economic implications. A figure is put on qualitative and highly subjective aspects in order to prioritise action.

This is the case for attributes of the problem such as its “environmental importance” and “perception of urgency”.

Other attributes may also be of interest, such as the extent to which it may be corrected, the company’s ability to rectify it, the length of the effects or the probability of the impacts taking place, among others.

The environmental review is an assessment of the company’s current situation regarding the environment, as well as the degree to which it complies with environmental legislation. It provides an overall assessment of competing environmental aspects in the company and verifies the various aspects to be considered in the EMS.

The company will find out the environmental strengths and weaknesses of its operations through the environmental review.

According to the definition of environmental policy, this initial inventory should make it possible to answer the following questions arising from the commitment to comply with the requirements in the applicable regulations:

- What legal regulations apply to the company?
- Are the workers aware of these regulations?
- To what extent are they complied with?
- Is the company willing to comply with these regulations? Can it do so?

This inventory should be drawn up by a team within the company with appropriate outside help, if necessary.

Two kinds of documents, which are a full part of the company’s environmental management system arise from this inventory of the company’s current situation: the environmental policy and the set of environmental projects and environmental complements of existing projects.

The environmental policy document is the logical consequence of the company’s commitment to carry out environmentally correct action aimed at sustainability.

This document sets out the commitment, prioritises the problems and actions and involves the following:

Title: The company’s environmental policy.

The company’s reasons for adopting this policy.

Statement of the policy, setting out the company’s commitment.

Statement of the environmental issues to take into consideration.

Processes and guidelines for implementing environmental policy and the code of best practice.

Defining the commitments and responsibilities undertaken.

Defining the terms set, if any.

This environmental policy statement should be communicated at all levels of the company and allows the general public to be informed.

In order to carry out this policy, the company develops a management system making it possible to take these general approaches and specify the day-to-day tasks.

Indifference is no longer an option for anyone. The environment cannot be considered a threat; rather it is an opportunity to improve efficiency and access new markets.

Many businesspeople are now aware that a responsible attitude towards the environment gives real added value to the product or service it offers society, as well as being an essential condition for the company's very survival in the medium or long term.

Implementing an EMS involves deciding to use a tried and tested methodology, which is a voluntary decision. It has proven to be an ideal way of making companies more consistent in their activities, products and services with regard to the environment, and a value in itself, while it also provides broader improvements to overall management.

It is also a means of accreditation or distinction that acknowledges the position and effort the company has made through certification by independent bodies.

Two kinds of certification are available in Catalonia: the certifiable or verifiable EMS are the UNE-EN-ISO-14001 standard and Regulation (EC) no. 761/2001 (EMAS II).

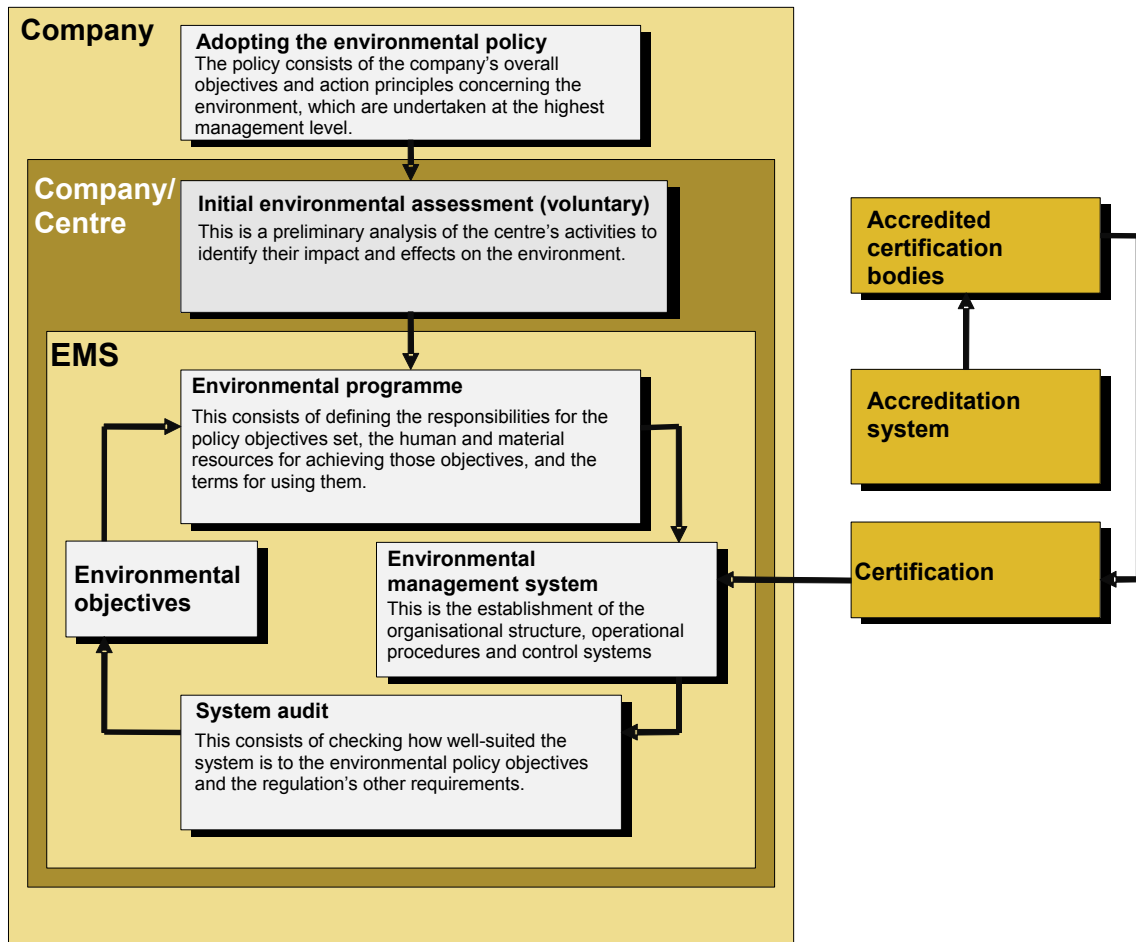
The ISO 14001 standard is in turn part of the ISO 14000 series of standards.

These quality standards are aimed at the quality of processes as part of the management system and the following aspects, among others:

- Environmental audits.
- Assessment of environmental actions.
- Ecological labelling.
- Life-cycle analysis.
- Environmental aspects in product standards.

Without going into technical aspects, their emphasis is on how to proceed. They are part of the trend towards greater professionalisation of environmental teams in companies, by having them made up of people with management qualifications rather than technical qualifications.

STAGES IN IMPLEMENTING AN ENVIRONMENTAL MANAGEMENT SYSTEM



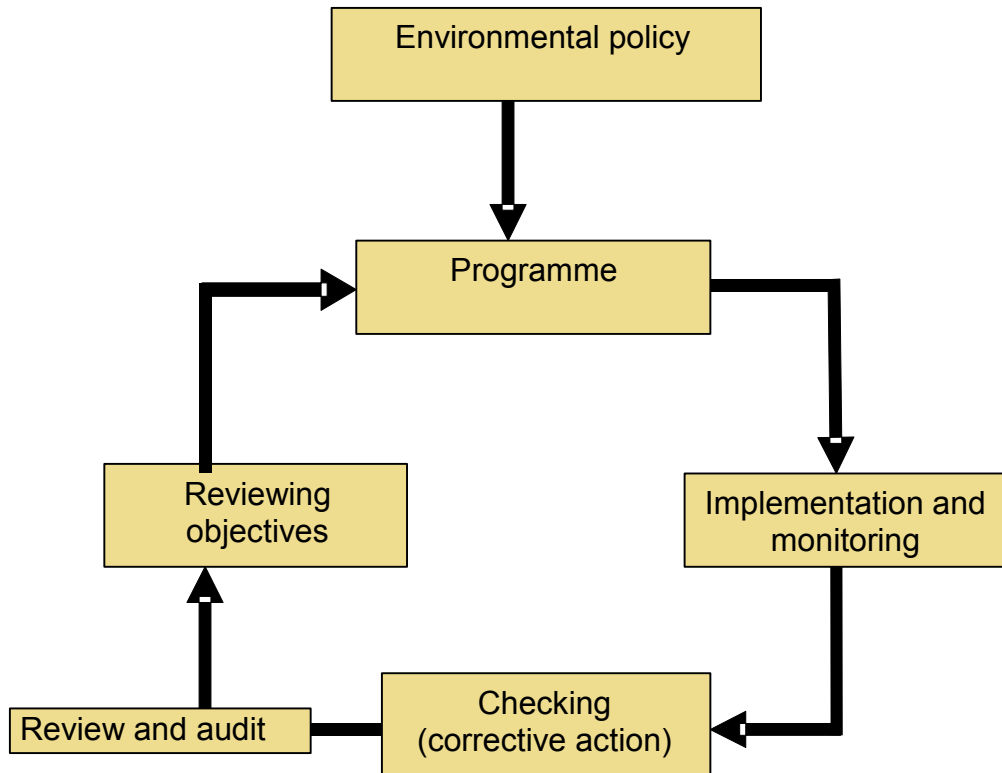
The environmental management system starts with the environmental policy. The environmental policy should set the guidelines chosen for the company's management and set out the group of projects evidenced in the initial assessment.

This programme is nothing other than the ordering over time of the various projects that the company intends to carry out according to the sustainability policy guidelines. The programme is a step further in progress towards greater precision. You initially start, very generally, with a commitment to carry out certain actions (environmental commitment) and a policy statement inspiring your action, and then move on to the more specific level of the action to be carried out in the next period.

In order to put the programmes into operation, their effects must be controlled: that is the meaning of the environmental indicators (see chapter 4). The allocation of skills and resources goes hand-in-hand with carrying out projects.

The auditing process reviews how well-suited the company's conduct is to the policies and objectives set and analyses the extent to which the milestones proposed have been complied with.

The ongoing improvement cycle is completed with the assessment of the results in order to rectify or modify the objectives for the next period.



We will leave the description of the indicators that make it possible to supervise the system until chapter 4 and the problems of communicating environmental matters to third parties until chapter 5. Here we will focus on a point that determines the success of an environmental policy: assessment of the projects.

2.5. INCORPORATING ENVIRONMENTAL VALUES IN THE PROCESS OF SELECTING INVESTMENTS: A NEED

Companies must calculate the economic impact of all projects in as great detail as possible. They must also calculate the impact of those arising from the preliminary environmental assessment or those that are part of the environmental programme.

There are two kinds of project, depending on whether they are started for basically environmental reasons or are additions to existing projects, and there are two kinds of variable: those that have a clear and direct cause-effect relationship, and variables that are difficult to quantify, the causality of which is unproven.

Economic analysis of projects focuses on the concept of ownership, the acquisition of means of production and the resulting generation of payment and collection flows due to transfer of the ownership. Environmental variables are partly considered from this viewpoint of acquisition (non-renewable assets, for instance), but also involves elements cannot be acquired or for which there is no market. Here are some of the problems this involves:

- a) Elements the ownership of which is transferred, but at prices that do not reflect the environmental side. Different assessments of the acquisition price are required when the figure on the invoice does not include the environmental aspect of the asset being transferred. Take for example the price you can get for waste and the cost of the waste in terms of the environmental impact it causes.

- b) Elements that are not part of the transaction but are directly affected by the company's action. For example, the effect of land occupancy on the landscape. Subjectively assessed costs can be set.
- c) Elements that are difficult to assess and have an unquantified relationship with environmental action: image, health and safety matters, among others. Subjective assessment is particularly important in this case.

If the analysis is limited to the traditional aspect of costs, the study leaves out environmental values that could be determining factors in the company's policy.

To put this another way: it is possible that one of the environmental alternatives defined as environmentally correct is the most costly and is rejected in favour of a less expensive one. If one leaves so-called "externalities" (aspects not taken into consideration in the financial model) out of the cost calculation, then environmentally incorrect decisions will be taken.

However, including other values in the policy involves assessing new conditioning factors, new environmental objectives, which require more variables. If these are assessed the order could come out the other way around.

When we speak of the economic impact we refer to costs, but we should also mention savings, cost savings that accountants do not consider, they simply record the costs produced. This masks the result of environmental actions. Mechanisms to describe these should be put in place (see chapter 3).

The importance of the economic calculation of the environmental aspect is of undoubted importance when it comes to selecting different alternatives. Here are some of the relationships:

Potential economic benefits	Potential environmental benefits
Cost reduction by reducing waste.	Less waste means less pollution.
Recycling to obtain new raw materials. Decrease in costs and benefits added	Less harm to the environment.
Making value from waste; higher profits and lower costs.	Increase in energy. Reduction in the consumption of environmental assets.
New, cleaner technologies.	Using emission savings for environmental improvement.
Technological changes to production processes.	Lower accident rate.
Increase in clean production.	Lower pollution.
Generating sufficient value.	Secure employment.
	Secure supply of products.

This table shows how the profitability of environmental management is considered a form of progress, based on a situation in which sufficient economic value is created, which is always a necessary element for sustainable development.

Although it is dealt with in greater detail in chapter 4, here are some indicators for each area of sustainable development:

- The economic side: profitability, productivity and value generation capacity.
- The social side: indicators for motivation and job satisfaction, good working conditions, good practices, a socially dignified salary, etc.

- The environmental side: indicators for material savings, reduction of emissions, reduction of waste at source, etc.

2.6. TWO INSTRUMENTS COMPARED: THE MATERIAL BALANCE SHEET AND PRODUCT LIFE-CYCLE ANALYSIS

How can value be added based on environmental principles? Two instruments can help us answer this interesting question. The material balance sheet and product life-cycle analysis.

The material balance sheet describes the production process based on studying the function of each and every one of the ingredients involved. With the aid of a flow diagram, it makes it possible to describe each element based on a concept very similar to accounting concepts: material inputs and outputs.

When carrying out an activity, especially if it is a processing activity, it is important to have a list of the process' ingredients, the amounts of materials to be used, in terms of inputs and outputs.

Even so, all of the goods employed are described. This includes reagents, catalysts and intermediate products and, particularly importantly, packaging. The inputs are all of the amounts of ingredients used, regardless of their source and whether or not they are part of purchasing flows (external purchases).

Material outputs are made up of the volume of materials of which the manufactured products are composed, plus the materials dumped, leaked or released as emissions. They include the waste generated.

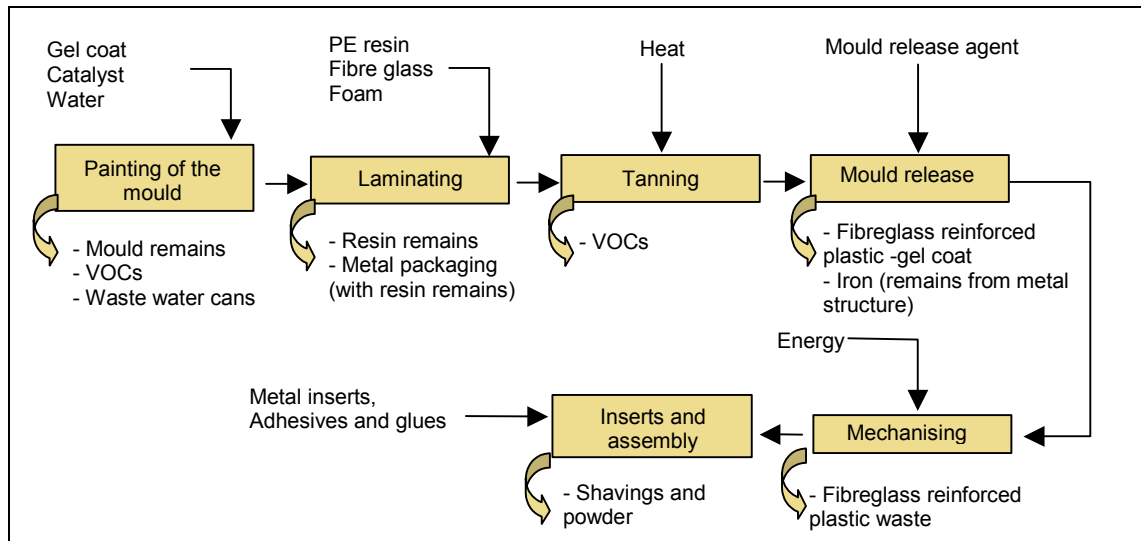
It is a description of the physical resources, without stating their values, such that the use would be calculated somewhat similarly to the following:

Water balance sheet	hm³ (thousands)
Inputs	
Rain-water collected	23
Piped water	200
Water from the company's wells	90
	313
Outputs	
Part of the product	230
Toilets	14
Outdoor sprinklers	10
Waste water	50
Miscellaneous	9
	313

When a material balance sheet is drawn up, a flow diagram of the company's processing is produced to show each kind of processing in diagrammatic form.

This expression is inter-related with the directional arrow. The direction of the material and all of the input and output points of reagents and sub-products are shown.

Environmental aspects of the item manufacturing stage



Source: Eco-efficiency initiative. Case studies. (Fundación Entorno).

This description depends on the conditions that the process will foreseeably take place under. These conditions are imposed by operational circumstances, the system load or amount of starting material input, and limits on reagents or catalysts.

After this overall description has been produced, it is divided up into areas, which makes it possible to study the process in each stage in detail, and the relationship between the resulting amounts of material and the amounts in the next stage.

In fact, this description is limited to the behaviour of the company's production or processing and is similar to the performance of a time study to assess how long the process takes.

In large or very complex companies, this chart is supplemented by data in the form of input/output tables. These are particularly useful in extensive zones or areas. An input/output table makes it possible to find out how money moves from one activity to another. It can be presented valued in tables based on conventional input/output tables.

These tables are produced with amounts, with assessed figures. Each row and column corresponds to a sector or element of the company's activity. A column for the valuation of emissions and other effluent that is unsold but transferred to the physical system is included in the non-market contributions column.

Its usefulness goes beyond diagnosis of the situation and shows the complex relations between the economic aspects and the rest of an activity's aspects. This table has two purposes: systematising the existing information about the environment and perception of interrelations between stages that, when duly integrated, make it possible to compare the state of the environment in different situations.

This precision enables a comparison or benchmarking with tried and tested best practices or better technology, since it identifies the situations you want to improve and is a calculation that makes it possible to determine the reduction in consumption, emissions and effluent.

Without this measurement instrument it is not possible to assess improvements to the distribution of products and the optimisation of production processes.

Although analysis of the input/output table and the material balance sheets focuses on the aspect of production of goods and services, the complete opposite applies to product life-cycle analysis. This focuses on highlighting environmental implications in all industries and processing, from obtaining materials to studying the disposal at the end of the product's life. The two instruments clearly complement one another.

Product life-cycle analysis is a process in which a product's environmental burdens are studied and assessed, the use of energy and materials, and dumping and emissions, is quantified in order to calculate the impact that using these kinds of resources has on the environment.

The study includes the product's complete life-cycle. It takes into account the stages of extraction and processing of raw materials, production, transport and distribution, their use, reuse and maintenance, as well as recycling and disposal of the waste.

The aim of these analyses is to show the interaction between the product and the company's activity with the environment in accordance with three aspects: firstly, reducing the impact the product causes, emissions and negative interactions with the environment; secondly, foreseeing the negative consequences of its use; and finally, third of all, identifying improvement opportunities.

The process of assessing the product's lifecycle involves the following stages:

- Defining the object and scope.
- Drawing up an inventory of the ingredients of which it is made up.
- Assessment of the ingredients' impact, concerning both the materials used in the product and emissions and dumping.
- Interpreting the results and proposing improvement alternatives.

The object of the two techniques is the same: pinpointing improvement proposals, i.e. technical drafting of projects in which the environment is the determining factor, either as a complement of the existing processes or new products and projects.

Chapter 3 deals with the project's economic and environmental measures.

3. ENVIRONMENTAL CRITERIA AND FINANCIAL MEASUREMENTS OF PROJECTS. ENVIRONMENTAL ECONOMIC ANALYSIS

3.1. INTRODUCTION

Companies act as organisations that create value, at least economic value. They create this through the market price that customers recognise their products and services as having.

The company's business carried out in the search for this recognition is analysed as a set of intertwined projects that weave together a varied way of performing and viewing business development in accordance with achieving this margin, which allows it to survive in a changing context. Today we have globalisation, and we do not know what challenges we may face tomorrow.

When you decide to start a business, you study it in the conceptual stage before putting it into practice, so the business is at first a project. Describing a project may be a complex matter. The economic study focuses on assessing two values: the value of the ingredients (factors) required for the project and the value the market recognises the products or services resulting from the business as having.

Section 3.2 goes into the details of this simplification process to model a business, from which a "project" arises that contains a description of the monetary flows that the business causes over the time the business is expected to last.

An investment and financing project

Projects fall into two different categories: firstly, projects that have an environmental motivation, which spring from action arising from the environmental policy and objectives set by the company. We will call these projects arising from the company's environmental policy. Secondly, projects that complement existing projects, other activities the technical and market side of which requires environmental action and reconsideration.

Reforestation of areas near a factory site as a way of repairing damage to the countryside, and building noise-reduction panels are representative examples of each of the kinds of project mentioned.

Any project can be carried out in more than one way; i.e. there is always more than one alternative. Point 3.2.1 sets out the criteria you can use to choose the best alternative for particular objectives (compliance, improvement, profitability, etc.). Annex 4 goes over the criteria used in the financial analysis of projects (NPV, IRR, NFV). Section 3.3 looks at the environmental impact of the measures described in order to move on to a written expression of measures that shows both the environmental aspects and the financial aspect of projects arising from the company's business.

From an exclusively financial point of view, there are loss-making projects in any company, which are carried out despite the cash deficit and losses they cause as they are useful in achieving other aims the company has, which are not sufficiently well-described in terms of profit (margins). For instance, these may be matters of corporate image, strengthening non-economic relations (often through so-called "social action"), strengthening leadership or creating barriers to entry, among others.

From a financial point of view, these projects are supported by the surplus from the rest of the projects the company carries out. More often than one would wish, environmental projects fall into this

category. This is often due to lack of focus and deficiencies in the process of calculating the values associated with the project, as we will see below.

In the same way, in any economy there are activities in which the margin between the inputs and the value of the products or services is insufficient to guarantee the company's existence, even when the company and the general public recognise the need for the product or service offered. For example, collection of urban solid waste, where the continuous service guarantee is financially backed with aid or subsidies from public bodies.

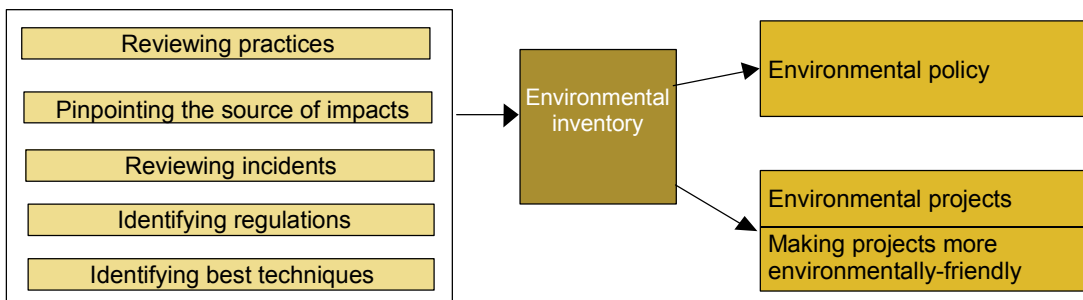
The final section analyses the composition of the various projects and lays the foundations for a decision about whether it is worth the project being subsidising either by the company itself or the public authorities. It presents a clear, graphical description of the company's environmental risk in the various projects.

In chapter 4 we will deal with the accounting descriptions inherent to the process of carrying out projects and supervising them, even when the accounting statements and financial analyses are part of the same money-good-money cycle as they are used to develop, whether within the context of the project (chapter 3) or the context of the company as the sum of projects being carried out (chapter 4).

3.2. DECISION-MAKING MODELS. HOW DO THEY SIMPLIFY A PROJECT'S COMPLEXITY?

When we looked at how the environment affects companies, you drew up an initial inventory of relevant issues. This inventory allows you to put a figure on the trends and pressures on the company and the environment and detect options for improvement and the situation of environmental aspects affected by the business' actions. This study of the situation and pressures gives the company's responses to the environmental side.

It is worth highlighting two responses: firstly, drawing up the environmental policy and drawing up projects, taking the environmental side into consideration in order to take action on environmental aspects. This is the basis of the company's environmental management.



Secondly, but no less importantly, it is worth stressing the drafting, implementation and follow-up of the company's policy concerning environmental factors. The company's environmental management, which regardless of its publication or communication to public opinion formers, marks a shift in people's behaviour and the company's actions. The result of this is the setting of the objectives that the company wishes to achieve in response to the environmental situation and the pressure on it.

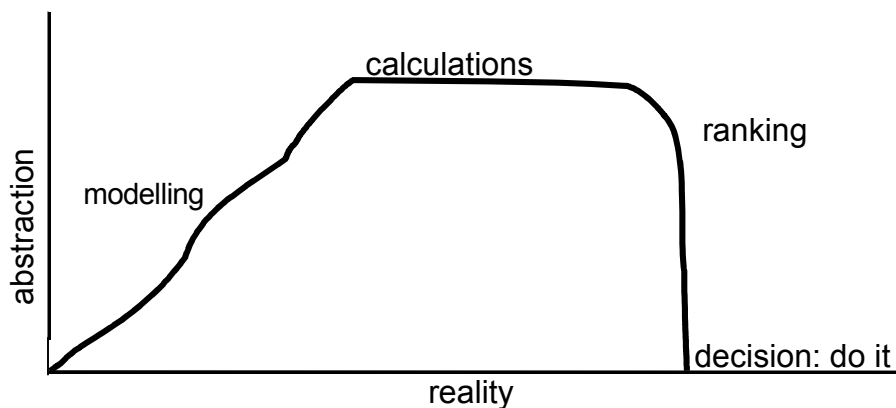
Drawing up improvement projects is the next step after studying the current situation. This study has been carried out with a clear desire to know how to act. The environmental inventory takes the form of considering future actions that improve the environmental situation or reduce the pressures that the company's business exerts. This means different kinds of action and different projects in the literal sense of planned activities. It is worth differentiating among these activities between those aimed at new projects in which the environment is considered like any other element, and those aimed at complementing, avoiding, reducing or restoring the effects of impacts on current processes or activity that the company already has in operation.

Although both types are considered projects, described actions the performance of which is being studied, projects that complement existing activities currently being carried out or performed are often analysed using different parameters (extra cost, reduction in risk, savings) to those used in projects in which the main function is creating value for the company, while taking environmental factors into account. When calculating the value achieved, the priority is put on assessing these kinds of projects.

There will surely be different ways in which each of the projects can be carried out, different alternatives determined by size, skills, technical restrictions and employment, among others. These alternatives are studied through various decision-making models, which contribute the following:

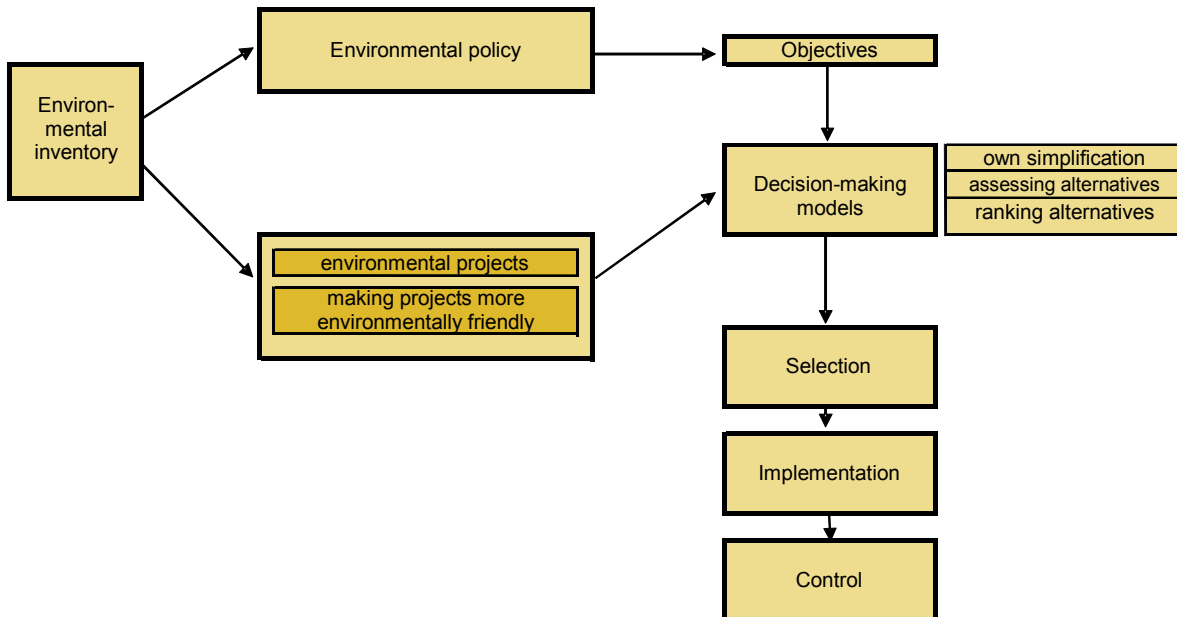
- a) The assessment of a project, i.e. reducing it to representative figures.
- b) Ordering the alternatives in relation to the objectives intended to be achieved through the project.

Reducing the complexity of a project and its interrelations to a single figure is a necessary prior step to ranking it and estimating its feasibility. However, such simplification comes down to the final choice of the person making the decision, who has a list ranking the alternatives, which leaves out certain aspects that will have to be reviewed to make the objectives and actions decided consistent. To put it another way: modelling helps define and clarify the problem and its ranking is acceptable to the extent that the model's restrictions and simplifications are.



Source: own data

There are different models that help you consider and assess the economic and financial issues associated with defining the project, and take the decision. The applicability of incorporating it is shown in the figure below:



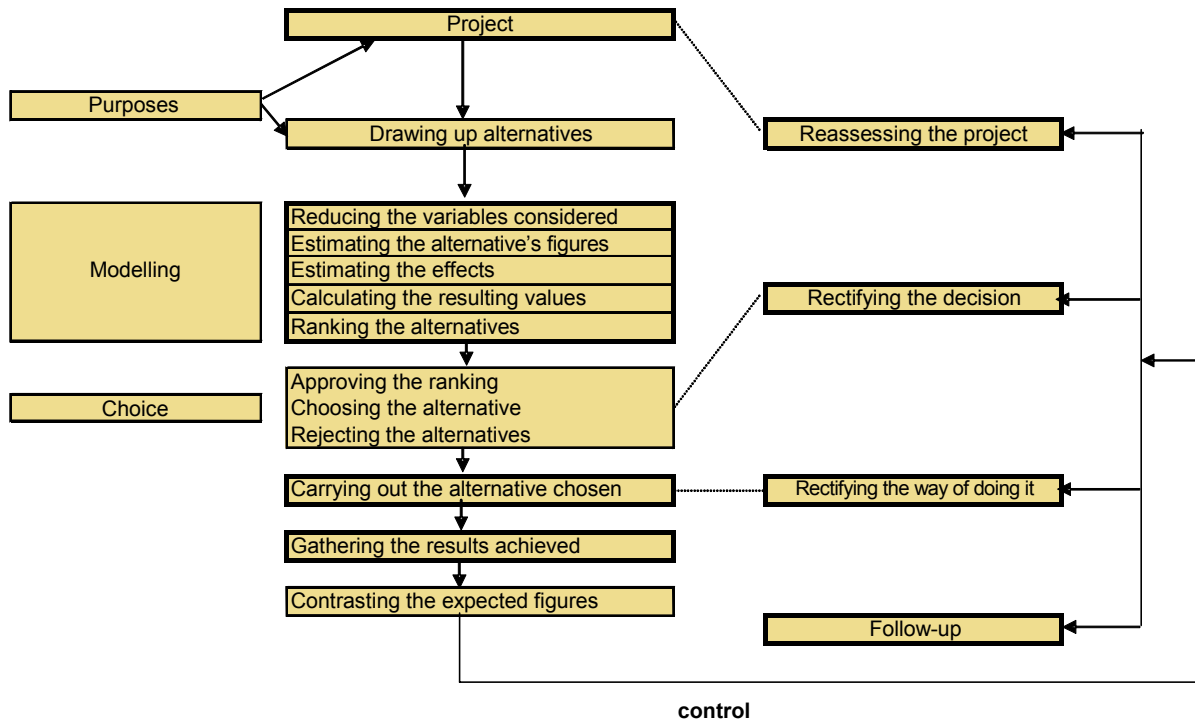
The environmental inventory arises from the company's environmental management and policy, which sets the milestones to be achieved. These take the form of different objectives that can be spread over time (objectives for the next two years).

These objectives are included in the models used to study the projects that arise from the initial inventory. Each of the project alternatives is assessed and measured in accordance with the company policy objectives. The best of the alternatives is then selected according to the ranking and consideration of the degree of abstraction of the models used in the assessment and ranking. The selection is finally carried out: it is applied and managed.

When the project is carried out, the alternatives that were not chosen are the opportunity cost of doing the alternative chosen, to the extent that the figures estimated for the alternative selected become objectives to be met by people with management responsibility for the pre-project then being carried out.

Imagine a company that has three hectares of non-development land, which it could use as a ground-level car park yielding €30,000 in rent each year or, alternatively, use the three hectares for a landscaped area. Choosing to landscape it means giving up the €30,000. In certain cases, this amount could be used as the economic valuation of the park.

Comparing forecasts and performance leads to monitoring the way in which the chosen alternative has been carried out. It should come as no surprise if the decision is changed if the results of the action make it advisable.



Control means the systematic comparison of the figures involved in the project, whether variables or parameters, and the figures achieved in carrying out the project. This comparison begins the process of management control or the search for the reason for the difference and the repercussions it has.

3.2.1. Figures used to describe a project

The description of a project involves an asset conversion process, which may involve either a qualitative or a quantitative conversion. This form of conversion is interpreted from different points of view. From an engineering point of view (the inventiveness to do something and do it well) it is described in terms of the material balance sheet and a set of indicators (basically non-monetary indicators) that describe this conversion. It is explained in simple terms as a production process, although it also includes technical aspects of distribution, POS management and waste and emission management, as well as so-called inverse logistics (meaning the management of the packaging return flow and aspects for its reuse) and collection of the product after its useful life, if applicable.

This activity is also analysed from a legal viewpoint by assessing the contracting process that enables the right to use the ingredients of this conversion process and gives rise to the relevant rights. The obligations inherent to the activity also arise from this, including the following functions: custody, safety (process, product and waste), recovery, restitution and redress.

The financial study of the project comes after the technical feasibility study. This means that the analyst, in carrying out a financial study, knows the necessary ingredients to carry out the project, and also has an estimate of the products that will need to be used as long as the project lasts and the resources consumed. How long the operational or activity period will last is also known. These figures may be known in terms of certainty or probability, which would make the calculation of greater complexity than we intend to cover in this chapter.

This bringing together the viewpoints of engineers and lawyers with a financial analyst's way of working starts getting complicated when one finds that the financial flows do not always match the physical or legal flows. For example, not all purchase agreements are paid/charged in cash.

Similarly, there are certain obligations that depend on a probable future event. This may mean adapting to the relevant regulations following an inspection and a fine. Both the amount payable and the inspection itself may not be fully known until they take place, even if the company precisely knows that certain rules apply to the situation. The legal obligation often arises regardless of how much the person or company concerned knows about the matter.

As well as physical, legal and monetary flows, there are flows of information and knowledge.

What it is and how it works must be known in order to take on projects and supervise them, or ensure that the objectives set in the projects are achieved. Information flows involve the following four aspects: knowledge, custody, construction and communication of information.

The flows described in accounting terms are part of this information and have features that must be reviewed in order to include elements of environmental management as we will see in chapter 4.

The basic figures that explain the project performance that are most widely used in the various forms of analysis and calculations that describe it are as follows:

- Income.
- Expenses.
- Costs.
- Cash movements.

By “income” we mean recognising the value of the business’ products or services.

This includes the income arising from transactions concerning the ownership of the product or service (income from a sale or sales) and income in the form of subsidies, the purpose of which is to reduce the sale price in order to target other objectives that the body providing the subsidy is targeting.

Strictly speaking, the concept “expense” is associated with the function of acquiring (purchasing) the necessary ingredients to carry out the planned activity. This is the value of the ingredients acquired, and only those acquired, in Euros. Any expense is the monetary equivalent of an acquisition.

The acquisitions carried out can be classified into two groups according to how they contribute to the production process:

- Expenses that are used just once in the production process (fungibles).
- Expenses that are used repeatedly in the production process (non-fungibles).

The second kind, non-fungibles, are often classed as “fixed assets” in accounting terms. Among fungible expenses it is worth distinguishing between fungible expenses that cannot be stored, or merely “expenses” (recorded by accountants in “class 6” accounts in the profit and loss account), and expenses that correspond to the valuation of acquisitions of ingredients that can technically be stored while they await inclusion in the production process (accountants record them in the purchases account, which describes the flow, and record the part not used in the process in the balance sheet under the stocks or warehouse heading).

The fact that we purchase things (expenses) that can be used more than once and volumes of things in excess of production needs forces us to distinguish between two levels:

- i) The acquisition process and its monetary equivalents: purchases and fixed assets.
- ii) The production process or consumption of ingredients to carry out the activity. This consumption often concerns one unit of product.

The economic valuation of the consumption is called the “cost”.

The concept of “cost” covers everything that is or was necessary in order to carry out the activity and covers various levels:

- a) Consumption of non-storable expenses (e.g. advertising, time, etc.).
- b) Consumption of part of the storable expenses (materials, basic ingredients, packaging, etc.).
- c) Consumption of part of the non-fungible expenses. This consumption corresponds to the accounting concept of amortisation.
- d) Consumption of purchased items (fungible and non-fungible), which were not purchased solely for the needs of one project in particular (for example, the salary of a manager of ten projects).
- e) Consumption of items not purchased but also used in the production process (water from a well on land you own).

It is pretty difficult to quantify ingredients types “d” and “e”. The way it is calculated and whether or not it is considered part of the production cycle is highly subjective, which makes the expression ‘cost’ and even ‘result’ so unclear to someone outside the company, while it is very useful as part of the process of supervising the activity.

It should come as no surprise that the language used for accounting data focuses more on the presentation of monetary flows invested and recouped, as is appropriate to the scope of annual accounts, which are freer of subjective judgements, as we will see in chapter 4.

Monetary flows are obviously “cash income” and “cash outgoings”, but it is worth differentiating between two ingredients of income and outgoings associated with purchase/sale transactions arising from the production process. On the one hand, the concept “collection” refers to the part of incomings from sale transactions alone (an increase in capital may produce an increase in income of cash, but not a collection). Strictly speaking, a payment refers to the acquisition of expenses. Thus the return of a loan may involve a cash outgoing, but not a payment.

From an accounting point of view, presenting cash flows in the form of an accounting statement is increasingly important. Changes in cash are explained by the various kinds of flows that are classified, depending on their source, into three groups: those that come from operations, those from investment projects and those from financing projects.

3.2.2. Criteria

What criteria can help you order and select the various alternatives? Let us group them into three main sections:

- a) **Compliance** with legislation and regulations. One option is always to infringe them and accept the risk this involves (fine, closure, harm to image, etc).
- b) **Improving** the environmental situation. The adoption of environmental impact criteria prevails over any other consideration.
- c) **Profitability**. The profitability of the factors used, mainly economic and financial factors.

It is worth mentioning that you can follow more than one criterion and it is possible to rank alternatives more than one way. It is also possible to use mixed criteria. We will now look at the traditional profit-based criteria, i.e. comparing the values of resources used and the values achieved.

Profitability criteria compare the figures used and the figures achieved (kg of detergent per kW used) and are complemented by saving decisions if the figures obtained are insensitive to the units invested. In that case the minimum cost or minimum consumption criterion is equally useful.

We cannot fail to mention how the consideration of the “minimum cost” criterion becomes environmentally operational only in the event of considering all of the associated costs.

We often have examples of the application of this criterion with a reduction of the costs to the financial concept, leaving out the environmental costs. In that case the environmental costs are considered an externality, i.e. and element outside the model that ranks the alternatives and is logically not included in the ranking nor, often, in the decision.

Criteria	
Productivity	Relationship between units produced/units employed.
Profitability	Value relationship between the units produced/value of units used.
Minimum cost	The value produced is insensitive: reducing the values (amounts) used.
Recovery time	Amount of investment/value recouped per period.

These are rounded off with criteria that stress the time aspect. Since any investment needs to be recouped, we will look at the time needed to recoup it.

We will choose the alternative that takes the shortest length of time to recoup the investment. This criterion presupposes that carrying out the project generates added value or cuts costs.

$$\sum_{j=1}^p R_j = I(1)$$

Where R shows the value of the initial investment (I) recouped in period j and p is the number of periods needed to recoup the investment.

The amounts recouped are compared with the total value of the investment to be carried out in order to calculate the number of periods that should be devoted to the project in order to recoup the investment.

This measure is sensitive to forecasts of obsolescence and even the risk accepted. It is necessary to operate (i.e. produce and sell) for p periods to recoup the investment made.

Annex 2 contains the traditional profit-based criteria and time-based observation of the flows that arise. In other words, it compares the values for the means used and the values produced bearing in mind the point in time.

3.3. ENVIRONMENTAL IMPACT ON PROFIT-BASED MEASUREMENTS OF PROJECTS

Measurements of projects’ profitability are based on observing the monetary flows the project generates throughout its existence. They comprise the flows that arise from the action (investment) and the flows determined by financing them (see annex 2).

Net present value (NPV), internal rate of return (IRR) and the net final value (NFV) are the most significant ones.

This heading contains some thoughts about the bias that financial measurements give to project descriptions, especially the impact provided by the environmental aspects the project involves.

The project's environmental impacts can be grouped into four sections:

- Impacts directly associated with the project's environmental aspect.
- Impacts included that are not associated with the environmental aspect.
- Impacts considered indirectly (better image, higher sales, better product design, savings on packaging recovery costs).
- Impacts not considered.

3.3.1. Impacts directly related to the project's environmental dimension

These impacts relate to cash flows arising from the fulfilment of environmental regulations, whether these are imposed by the government or have been adopted as a result of the project management's sensitivity in this area. In accounting terms, administrative regulations for identifying environmental costs are frequently really clear. See for example what is stated by a Spanish regulation on appraisal and notification of environmental matters in annual accounts:

"Expenses undertaken for environmental activities carried out or that must be carried out within the scope of the management of the business activities' environmental effects shall be considered to be environmental costs, as shall expenses arising from environmental commitments for the prevention of pollution caused by current operational activities, waste and spillage processing, pollution control, replenishment, environmental management or environmental audit."

(Regulation of 25 March 2002 of the Institute of Accounting and Accounts Auditing, which approves rules for the recognition, appraisal and notification of environmental matters in annual accounts. Official Spanish State Gazette, 4 April 2002).

Taking into account the environment/cash position cause-effect relationship does not derogate from the impacts of the activity on the environment that are beneficial but do not have monetary repercussions, in particular the "profits" from preventive actions against damages.

The project provides an in-depth account of all the expenses related to the impact prevention plan. Should they not be collected, this prevention policy will not take into account the benefits caused to the environment and the community.

This asymmetry of approach in regard to environmental impact favours the meaning of "environmental costs" to be included in a project and leaves aside the benefits of environmental actions.

Such asymmetry produces a misplaced perception that leads to a reactive decisional behaviour: we expect the rule to have minimum repercussions. Environmental impact is reduced to an "additional cost" arising from the government's environmental policy and not from the business activity. More demanding governments generate different environmental costs than more lenient governments impose on the same operating activity.

3.3.2. Impacts included that are not associated with the environmental aspect

The idea of eco-efficiency has an economic basis. Reducing consumption by using better techniques or reducing consumption by reusing factors is an aspect that has an effect on the profit and loss account and the cash involved in the project: purchases and payments are reduced.

The financial description includes the amount of flows expected once the reduction is known. The amount saved is left outside of this calculation. Therefore, the positive effect of reducing consumption is ignored and diluted in the description of the resulting amount.

Take for instance the reduction of water consumed per unit of production due to installing a collector and rectifier of the water used. In this calculation you know the following:

- The payment made for the installation was €3000 and it will last five years.
- The installation and rectification maintenance costs are €400 per year.
- The amount of water recovered is around 60% of that consumed. Consumption would be €8000 per year without the impact of the reuse measures taken.

The project would include the €3000 investment and €400 in rectification expenses (paid), plus “real” consumption of €4000.

After taking into consideration the €400 annual expenditure, the estimated result would be actual consumption of €4000 and an estimated €600/year amortisation ($€3000/5 = 600$) for the installations. To summarise: an impact of €5000 ($4000 + 600 + 400$) for water consumption.

The impacts of the eco-efficient action have been described asymmetrically in the financial model. It would at least be worth mentioning the “saving” concept in order to satisfactorily explain the impact of the reuse:

Expected consumption: €8000.

Actual consumption: €4000.

Rectification cost: €400.

Amortisation: €600.

The water consumption would be: >€3000 saving compared to no reuse

($8000 - 4000 - 400 - 600$)

The fact that the results are one element used to estimate the taxes on the company's profits undoubtedly conditions a large part of the way in which the financial year's results are calculated. The results in environmental terms do not currently have any usefulness as a basis for calculating tax returns.

3.3.3. Impacts considered indirectly

These are a variety of environmental aspects that have an effect on the economic behaviour of a variable together with other actions the company carries out. When the accounts are presented in the analysis of the project, the resulting figure is often shown without mentioning the environmental effort or the environmental repercussions on the figure. Imagine the possibility of a market in which consumers are willing to pay a higher cost for products that are environmentally-friendly in terms of both the production process and the consumption process.

Such a perception would surely be supported by information campaigns and changes to packaging, among other aspects. How could the contribution of the environmental factor to the growth in turnover be explained?

We would all agree that it could be reflected in the price, but to what extent?

This gives rise to “intangibles” and the corresponding problem of assessment, in which a value is put more or less subjectively on part of the growth or the amount of the environmental side.

Being considered “environmentally-friendly” has a positive and noticeable impact. You merely need consider the opposite situation: the effect that publicity that your product is harmful to the environment would have on turnover. It would appear that intangibles are easier to appreciate when they have a negative effect.

In the same way, consider better management, which results in a lower cost or value of the waste due to separate collection. Why simply describe the resulting price and the expense and payments

involved in investments in materials that enable separate collection (advertising, training and bins) mixed up with the rest of the items in the results?

There is thus a need for an environmental profit and loss account, which is an aspect we will deal with in chapter 4.

3.3.4. Impacts not considered

The impacts not considered appear when one looks at aspects that are not acquired or on the market, but are involved in the project activity. They include both aspects accepted by the company carrying out the project (accepting risks of accidents, for instance) and aspects accepted by the community in which the project is being carried out and the products are being used (such as noise, changes to the microclimate or traffic implications).

The negative factors in this list of impacts are grouped within the concept of externalities. Even so, it is worth internally recognising these costs and the income or positive contributions the project makes to society. Being an accountable company means moving from a strictly financial viewpoint to a broader context in which sustainability variables are included (chapter 4). However, they must first be taken into consideration in decisions about projects (company projects). Therefore, these impacts need to be known, measured and valued.

The impact inventory stage described in chapter 2 will surely enable you to identify many of these aspects, which are currently ignored in decisions to accept or reject projects. Different decisions might be made if all of the impacts, and not just the monetary impacts, were taken into consideration. In addition to the resources generated, you would consider the contribution to sustainability, lower emissions of pollutants, best practice, land occupancy, damage to the scenery, traffic conditions, redress for damages, reduced risks and recovery practices.

3.4. PRODUCING ALTERNATIVE OR COMPLEMENTARY MEASUREMENTS

When you interpret a project from both points of view, financial and environmental, two actions are involved: reformulating financial calculations to include the aspect of the environmental factor that has not been described and complementing the information to include the environmental impacts not involved in the financial measurements.

It is as if you were looking through binoculars rather than a video camera.

To look at it from this point of view you must look again at the technical side of the project to distinguish between two kinds of impacts:

- i) Environmental impacts.
- ii) Financial impacts.

However, you could expand these impacts with social or even ethical aspects in order to produce investment selection models from the viewpoint of sustainability. This aspect is beyond the scope of this chapter and focuses on studying two sides of eco-efficiency: economic and environmental.

The description of the impacts, environmental and financial, is carried out using different indicators. Profitability measurements include various indicators such as resources generated and profits before and after tax, which concern finance.

Description of the performance of the environment in relation to the project can also be included in various indicators. We will group these indicators according to the same structure as determined at in the initial inventory, when we set out the challenges of environmental management (see chapter 2).

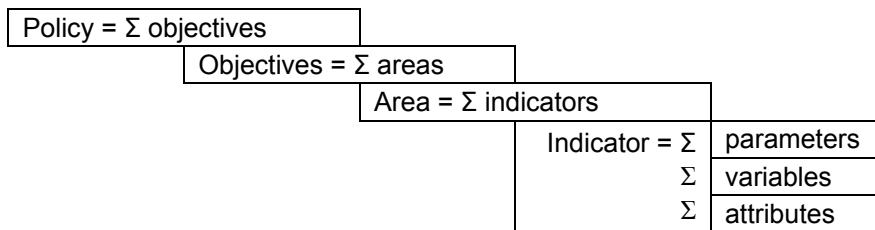
Generally speaking, it is as follows:

Indicator grouping

Each of the areas can refer to various stages in the process set out in the project. There may also be different markets or different stages in the production process, or levels of activity. It all depends on what kind of project it is. Obviously, not all projects involve all of the aspects.

Doubts often arise as to whether or not it is necessary to attribute an effect (indicator) to an area. The general criterion for attributing them should be transparent and as objective as possible. One good criterion is to attribute to each of the areas and each of the projects only the effects that are directly linked to their existence. In other words, the effects that would not exist if the project ceased to exist.

The environmental policy sets out the basic guidelines for a company's environmental actions, which take the form of action plans studied as projects:



The indicators are described according to the impact and the measurement possibilities.

In this case you will also find difficulties with precisely measuring them, and will also use probability figures for parameters and variables, just like with financial indicators.

Here it is rather important to present lists of indicators and use the structure of PSR indicators (pressure, status and response), which we will go into in chapter 4.

Unlike the financial sphere, not many methods have been worked out to aggregate these results and present a synthesis figure in the manner of NPV, IRR or NFV, which represent all of a project's impacts.

Despite this, it is always possible to prioritise the indicators, to set the order of importance. Their importance can be determined based on a subjective estimate of features of the indicators and the figures they measure. Giving a score from 0 to 3 (a lot, a little or nothing), with each indicator's score weighted by the importance of each area, as defined in the company's policy, allows you to put a rough figure on the importance of each of the indicators and order them from highest to lowest importance.

There are two stages in this process:

- a) Determining the importance of each area and objective.
- b) Determining the importance of each indicator in each of the areas.

The importance of the objectives arises from the very definition of the environmental policy, since after the main points of the policy have been listed, their performance must be prioritised.

The importance of the areas affected by the project reflects the importance of the company's environmental policy.

In order to order them, select attributes of the areas such as:

- I. Their importance for the environment.
- II. The seriousness of the situation (the project's relationship with the environment).

- III. The difficulty of taking action due to the company lacking the skills to modify the impact.
- IV. The difficulty of taking action due to the costs of modifying impacts.
- V. The perception of the need for improvement.

This gives you a table like the one below:

	Importance	Seriousness	Competence	Costs	Need	Area weighting
Area	(i)	(ii)	(iii)	(iv)	(v)	(VI) = (i)+(ii)+3*(iii)+3*(iv)+3*(v)
"A"	5	4	1	1	1.5	19.5
"B"	8.5	7	2	1	2	30.5
"C"	8	5	1	1	1	22.0
"D"	6.5	6	2	1	3	30.5
"E"	8	6	3	2	1	32.0
"F"	4	8	3	1	2	30.0
"G"	6	7	2.5	2	1	29.5

Note that the scoring system was different for attributes (I) and (II), which had a score from 0 to 9, while the next three attributes were scored from 0 to 3.

Column VI allow you to class area "E" as the most important and "A" as the least important. In this case, all of the attributes (importance, seriousness, competence, costs and need) are seen as being equally important in the company's policy. Otherwise you would give a weighting to each of the attributes.

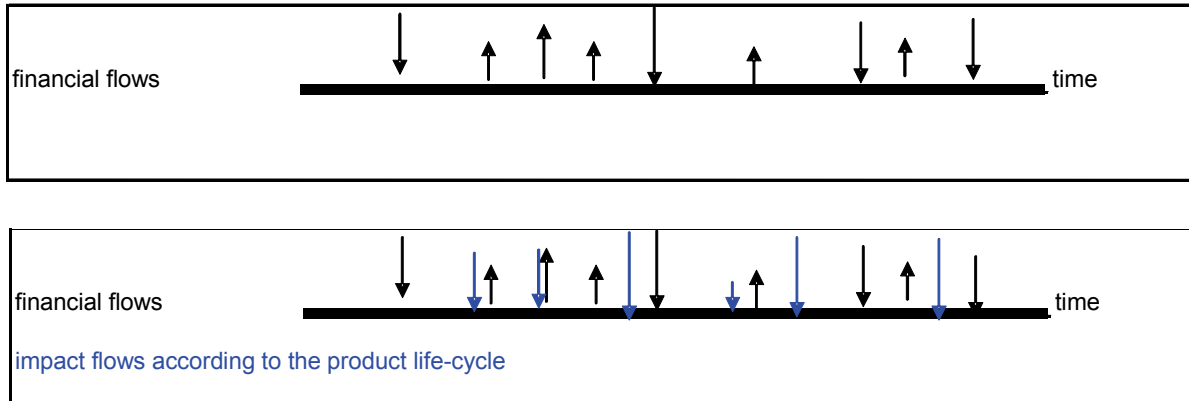
Other attributes can be added to the table to adapt the project's complexity to the company's environmental policy. You could also add the importance to the company of the possibility of an accident, the difficulty of repairing damage, the cost of neutralising the impact and the cost of a fine, among others.

Once the importance of each of the areas has been assessed, you can also estimate the significance and importance of each of the indicators to show the area's impact. In a similar way to the areas' attributes, we will examine the indicator's following attributes based on its ability to explain the project's impacts on the area:

1. Amount of non-redundant information provided.
2. Reliability of the indicator figure measurements.
3. Degree of objective measurement.
4. Evidence of cause-effect relationship shown.

It is true that we could use different figures, but in any situation the value of each indicator needs to be estimated. This estimate can be carried out on many levels, and the definition of the company's environmental policy will set the criteria for the environmental objectives that the company is intending to achieve, and set its priorities.

The description of the project's ingredients is no longer a monetary description based on cash flows and results, and is situated along a time axis to describe these indicators together with various physical impact indicators (see the figure below).



The search for eco-efficiency is not a problem in which the flows of each kind, economic and environmental, are analysed separately, quite the opposite; one does not make sense without the other. Although you will be aware of situations in which the two aspects have the opposite meaning, it is also possible to observe coincidences, points where the achievement of environmental indicators is converted into a positive cash flow or benefit.

We will focus on these intersecting points and select a representative aspect that makes it possible to assess and move from one area to the other.

In any project, you can find an environmental impact indicator that has clear parallels in the achievement of cash flows. We have already seen a few examples: cutting purchases by reusing ingredients or revaluation of waste through separate collection, among others.

You can take advantage of these kinds of indicators to carry out a monetary assessment enabling you to group together all of the flows in a project, monetary flows and environmental flows in terms of monetary equivalents.

Take for instance a case in which area “C” is defined as “reuse of ingredients in the production process”. There are three indicators in this area:

- Reuse of waste water.
- Reuse of packaging of materials used in the product.
- Reuse of catalysts.

The indicators’ explanatory ability is 40%, 35% and 25% respectively, according to the technical possibilities of the production process being analysed.

We know that reusing waste water involves a reduction of €3000 in water purchases. It is easy for a company to calculate this amount objectively, simply by looking at the bills.

You can make all of the indicator units equivalent based on their relative degree of importance, proportional to the impact of the importance points for that indicator.

Since the 40% explanation of an area with 22 importance points implies a value (saved) of €3000, we can assign an equivalent to each importance point of (€3000/22 points), i.e. 136,363 per importance point.

We can thus convert the various indicators that are in physical units or percentages into a monetary equivalent. It is true that this valuation of the environmental impacts has no market to regulate the price, but it is no less true that projects are compared using the same yardstick. The possibility of intervening in conventional markets has parallels in the existence of values accepted by the community (society) that is taking on the project through agenda 21 (see chapter 5).

In any case, this relationship of exchange between physical units and monetary equivalents is nothing new in accounts; estimating opportunity costs or prices is one example. In the same way that in calculating the cost of a unit of a product an accountant would estimate the water consumption from a well owned by the company from the price it would pay if it needed to buy the water, you can find an equivalent that lets you measure the environmental impact in monetary units.

The analyst's viewpoint always focuses on calculating objective, projected figures, which, if chosen, become milestones to be achieved and bases for establishing the biases in the projected figures and the figures actually achieved in carrying out the project.

Since the financial impacts have already been translated into monetary equivalents, we can reformulate the figures of a project's net final value in the following way:

- The financial figures are converted into a set of specific cash flows, ct , i.e. a cash surplus of c Euros at time t in the project lifetime.
- The impacts expected for time t , which will have an equivalence of mt Euros in monetary units.

For calculation purposes, we can calculate the following net final value, which we will call the eco-efficient net final value.

$(ENFV) = n n$

$$ENFV = \sum_{t=1}^n ct (1+r)^{n-t} + \sum_{t=1}^n mt (1+p)^{n-t} \quad (9)$$

The first part is the same as the formula used in financial analysis, and the second concerns the monetary equivalence of the impacts forecast over the n periods the project is being carried out in during the relevant period. The two are extrapolated to the last day in the projection horizon with factor p and r . The factor p shows the progressiveness of environmental impacts. It is a new figure to foresee, just like the expected reinvestment rate of the monetary flows located at a particular time until the end of the project horizon (r). (See annex 2).

The estimate of r depends, among other matters, on the forecast growth of the capital market and investment opportunities in profitable projects. The estimate of the progressiveness factor (p) depends more on natural events, as it interprets events such as progressive degradation, which is relatively easy to work out for each indicator. The adoption of a measurement generates an impact that we assume to be unfavourable and, if not corrected, will worsen over time. The figure for redress tends to grow. This growth factor leads to the appearance of the maximum progressiveness factor if you can interpret the physical system's ability to regenerate as being decreased by the accumulation of elements or impacts to be regenerated.

This value (p) to be determined in each of the company's projects or the various alternative action proposals provides a further point of comparison, which we think has a broader scope than the rest of the criteria set out. However, this does not mean that it replaces criteria. There are simply new metrics for ranking action alternatives according to financial efficiency and environmental efficiency criteria; which is ultimately eco-efficiency.

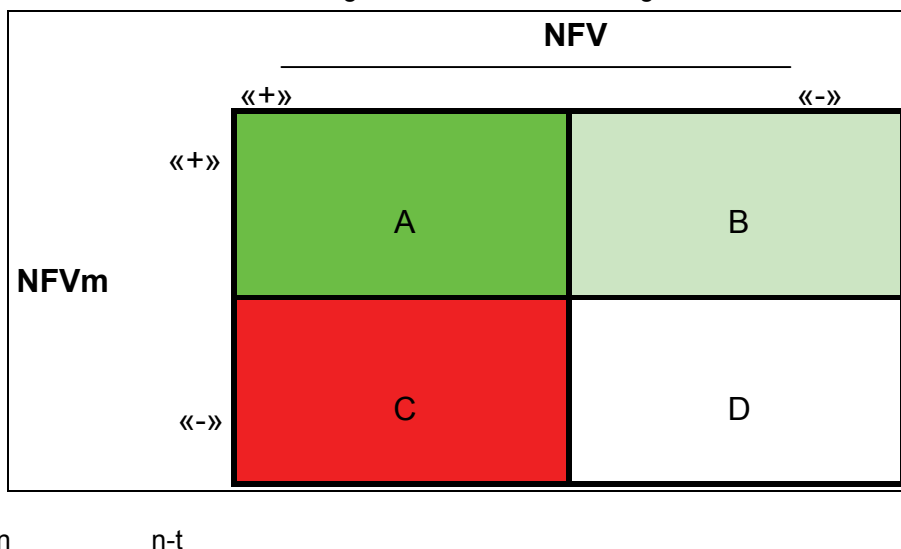
Adopting these criteria involves a systematic explanation and analysis (report) on the two elements in the expression of eco-efficient net final value, which are the financial aspects (all of the financial flows, including the environmental ones) and the environmental aspects (all of the impacts on the environment), which we will deal with in the next section. Bear in mind the idea that, since we can establish accounting indicators in order to assess the monitoring of financial flows (ct) and the NFV, we can also design accounting indicators concerning the position and result, in order to assess the monitoring of environmental figures (mt) and the ENFV. We will go into this in chapter 4.

3.5. CLASSIFYING PROJECTS BASED ON THE ENVIRONMENTAL ASPECT CONSIDERED

We have worked out an expression of the eco-efficient net final value that includes the impacts of the project assessed and expressed in terms of the resulting values at the end of the project planning process. This expression synthesises different values of economic, financial and environmental indicators, which have a two-fold use: on the one hand they constitute ingredients for assessing the company's action alternatives and, on the other hand, when the alternative chosen is carried out, they are converted into objectives, milestones that can be achieved by the various agents involved in carrying out the project.

This tried and tested usefulness in the financial area enables it to be extended to the environmental side. It is the basis for a set of indicators or a balanced scorecard in which the environmental side is extensively represented.

At the time the choice is made, we can establish four categories of projects according to the values of the components in the ENFV. These categories are shown in the figure below:



The $NFV = \sum_{t=1}^n C_t (1+r)^t$

$t=1$

and the $NFVm = \sum_{t=1}^n m_t (1+p)^t$

$t=1$

They are ordered from highest to lowest, as shown in the figure. There are four kinds of projects, which are detailed below.

Zone “A” concerns projects in which the environmental added value is considerably high and also the project's financial profitability. This concerns alternatives in which the match between the environmental and financial values makes the project acceptable from these two viewpoints. Neither a financial analyst nor an environmental manager would have any reasons for rejecting the project.

Zone “B” concerns alternatives in which the environmental aspect has high added value, but the financial profitability is classed as low or even negative. The project will have to be reoriented in order for the project's environmental added value to be recognised by the market or subsidising bodies so that it is more profitability or at least breaks even.

Zone “C” shows the danger of having action options that generate high value or financial profit, but also have high environmental costs and a zero or negative environmental contribution. The company’s ethical behaviour in rejecting these kinds of projects becomes important here.

Zone “D” makes it possible to work out the alternatives in which there is a total match: it is no good from an environmental point of view or from the viewpoint of financial profitability. The reasons for starting these projects disappear just as fast as a businessperson would pull out of a project that ended up in this zone due a change in attitude or regulation by the market or the public authorities.

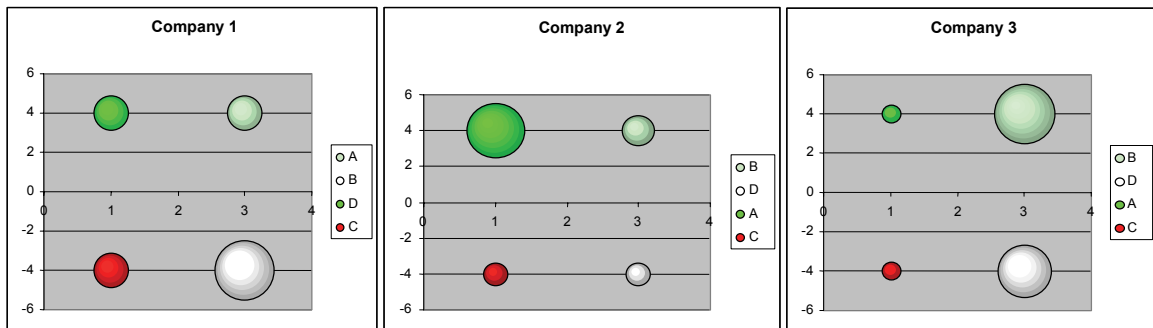
We think that the logical position the public authorities would take within this conceptual framework and the four zones is as follows:

- Type “A” projects: do nothing. Recognise the value through quality certification (‘carrots’).
- Type “B” projects: assess whether it is worth doing it as an environmental project and provide a subsidy to cover the loss until the project borders zone “A”.
- Type “C” projects: use ‘sticks’ to dissuade them, such as environmental taxes and penalties to make the financial profitability less attractive.
- Type “D” projects: inform the company of the situation (environmental).

Up until this point we have spoken of projects, i.e. considering the performance of activities. This analysis is just as valid for projects that the company is already carrying out.

From this point of view, we can associate the concept “project” with the product/market binomial in order to analyse the composition of the company’s products and position them in the zone they belong in.

It is particularly useful to have a figure showing the total sales or total production distributed on this grid and the relevant percentage of sales.



4. DOING THE ACCOUNTS: FROM BALANCE SHEET TO BALANCE SHEET, THROUGH BOOK PROFIT

4.1. INTRODUCTION

In chapter 3 we looked at the stages in the decision-making process and the incorporation of environmental variables in to the entire process, from detecting the problem to putting action into effect to solve it. Chapter 4 looks at the control mechanism developed in order to find out how effective the planned decisions are.

The results analysis process is meant to be a tool that is in constant use. After the results have been analysed, decisions are modified or other new ones are taken that will need to be monitored, their results must be determined and then compared with the expected effects and figures and then ... back to the beginning again, we start the cycle over.

This cycle requires a permanent information gathering structure that makes it possible to monitor projects and actions and highlights the new knowledge that arises from them. This is analysed in section 4.2. Throughout this section we will move on from analysing the project's scope to establishing control indicators at the level of the enterprise. By enterprise we mean a basket of interacting projects.

We need an information system that is capable of recognising the behaviour of each and every one of the figures involved in the project and, no less importantly, a system that can produce mechanisms capable of aggregating results. All this should be carried out in a manner that is clear for different people at different action times. For financial matters there is an accounting system, which, as analysed in section 4.3, has certain incompatibilities that make it unable to adequately include environmental action.

It is worth having a system of indicators that can be used to gather information from the reports. Section 4.5 sets out the main argument for the information system: its usefulness. The reason it exists is because it is used in the decision-making process by decision-makers. Indicators are thus the basic units of the information system.

The last two sections are devoted to the structure of indicators and indicator systems. It ends with the presentation of an environmental results model that makes it possible to develop indicators similar to the financial result and become a useful model for environmental accounting.

4.2. CONTROLLING DECISIONS AND PROJECTS. MEASUREMENTS

4.2.1. Control

In the last chapter we looked at the decision-making process applied to projects and how, with successive aggregations, we reduced a project to financial effects, to a group of (different) flows spread over time, which this project is expected to have (See chapter 3).

The decision becomes a choice, and the adoption of a particular action involves the risk of making a mistake. In other words, choosing a decision that, for different reasons, does not lead to the expected results, or has results that could be improved.

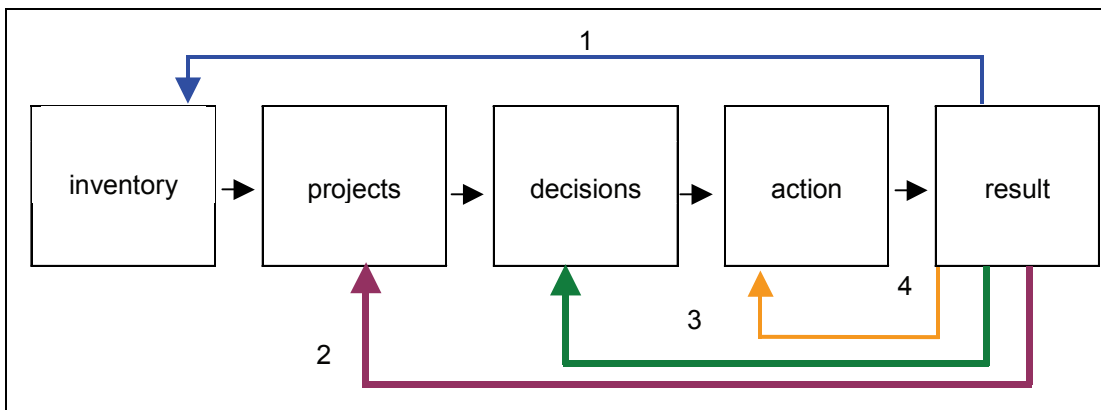
It is true that you cannot look at it in this way once the action has begun. If that were the case, the action would not be carried out; you would change and do something different. The information showing that the decision was wrong is known after the planned action has begun. The mistake is often caused by situations or behaviour estimated in different terms to those that actually take place, or unexpected situations or behaviours.

It is thus necessary to know whether the premises and forecasts for the figures included in the project are as expected and to what extent. That is the purpose of the management control system, which is part of the environmental management system.

By observing the results you can establish relationships in which the expected figures (parameter values or variables) are compared with the figures resulting from the activity. Any deviations are revealed by this comparison. This is the first step in verifying that the cause-effect relationships inherent to any project are being fulfilled.

This practice creates an additional knowledge effect: contrasting. It also implies knowledge that is well worth managing: experience.

In any case, the implications of analysing the results by comparing the expected figures relate to different levels (see the figure), which we will analyse below.



Studying the result leads on to new aspects, new knowledge of the company's relations and its projects in relation to the environmental impacts (aspects). Experience confirms the relations and also new knowledge that may possibly extend the scope and complexity of the study of the company-environment relationship. It is worth mentioning this "learning effect" in fields in which changes in technological knowledge open up many possibilities for change and improvement. This is line 1 in the figure.

Studying the result also implies contrasting the variables gathered in the project definition and makes it possible to reflect on the significance of the figures involved and those excluded (line 2).

Studying the result adds ingredients for validating the decision's modelling and whether the right alternative was chosen. It adds new knowledge about the possibilities of modelling the environmental impact and makes it easier to determine these variables in later decisions.

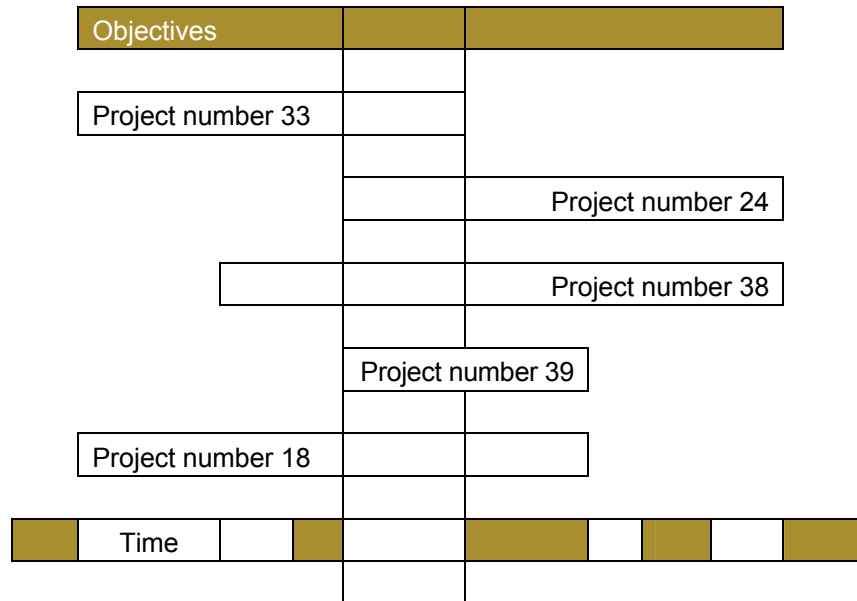
In short: it improves the model through contrasting and rectification (line 3).

Comparing the result achieved with the expected result may be extremely useful in measuring how efficiently the actions are being carried out, meaning the way of producing the paper figures and converting them into reality; all in all, the performance of the decision is assessed by analysing the results (line 4).

4.2.2. The enterprise: a basket of projects

In order for the project to take off effectively it is worth having indicators to measure the bias between the planned values (for example, the reinvestment rate r) and the actual values achieved. This is dealt with by management control and using accounting analysis (of costs) to determine the deviations attributable to price differences and technical efficiency.

When you apply this to a company you come up against the realisation that the company is not doing just one project, but quite the opposite: various projects are going on at the same time. The company's situation arises from adding the various projects together, as shown in the figure below:



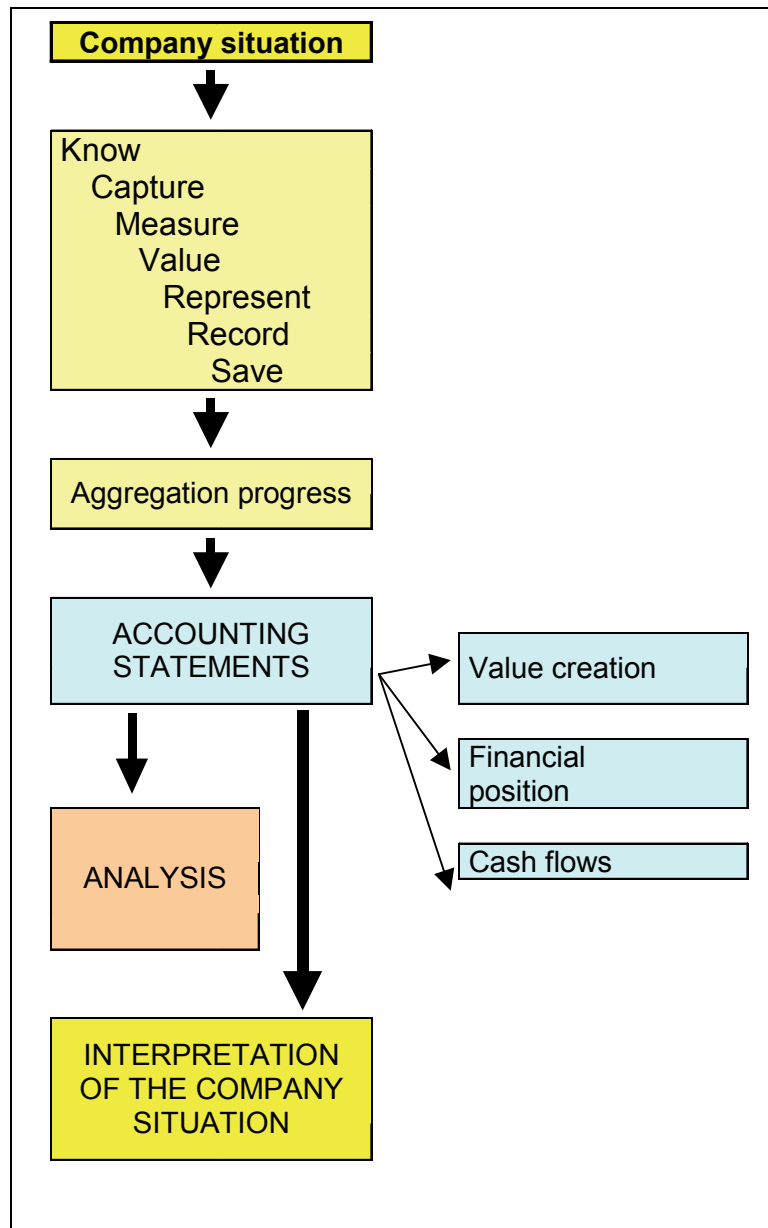
The company becomes a kind of basket of projects and you must use a stable mechanism to appreciate the complexity of the various projects going on at the same time, at the appropriate level of detail. It is necessary to have a company-oriented accounting system able to provide aggregate information that is sufficiently detailed to be able to assess the development of one project in particular.

4.3. FINANCIAL ACCOUNTING: COMPANY CONTROL TOOL

Remember that the financial figures analysed are all of the payments and collections attributed to the project. It should thus come as no surprise that the start of the accounting system involves exactly that: gathering and presenting cash flows. Right from the start, note how the concern to describe a project's flows becomes, in accounting terms, a concern to describe the flows of all the projects that have taken place over a period of time. To put it another way: the grouping together of flows into projects gives rise to accounting modelling based on periods of time.

The purpose of the accounting system is nothing other than to provide useful information about the company's financial position, and assess its net equity and the results obtained. These must be determined in an objective, complete and structured fashion, taking into account all of the projects the company has underway.

Everything gathered by the accounting system passes through these stages, which characterise the way the system works and also condition how useful it is to include all of the environmental variables, as we will see below.



The accounting system records two processes in parallel: the monetary resource generation process and the value generation process. At the risk of oversimplifying, we will reduce the range of information the system produces to three basic statements:

- i) The profit and loss account, which measures the increase in value achieved during a financial year. It is usual to differentiate between the operating, financial and extraordinary profits/losses.
- ii) The cash flow statement, which shows the generation and availability of resources making it possible to carry out and finance the company's business.

The flows are classified in terms of whether they come from "operations", "investment projects" or "financing projects".

- iii) The balance sheet, which separately sets out two aspects of the projects underway:
 - a) The assets on the balance sheet, which describe the make-up of the various investments the company has carried out in starting all of its projects. These are investments it has made and expects to recoup in the future. The investments are grouped in terms of their degree of use in processes and with special reference to whether the goods are fungible and the length of time the company will be carrying them out, distinguishing between short-term and long-term.
 - b) The liabilities or financial structure of the balance sheet shows how the company has obtained these resources: financing by suppliers, bank financing, shareholders and resources from the company's business (reserves).

The accounts play a key role in providing information and feeding the various indicators for the company's financial management and its general assessment, from both an internal point of view (balanced scorecard) and from the viewpoint of information made available publicly (annual accounts).

Since the accounting reform of 1990, when the emphasis was put on the aspect of communication and public recording of accounting data, we have been able to see how accounting successfully plays the role of communicating data. Nowadays, the accounting data are a means of communicating with society.

The accounts play a major role not just in generating information, but also as a means of communicating with society that directly affects the image of companies' and organisations' actions, as well as the actions of various social agents. It also provides valid ways of setting governance targets for companies and institutions. It contributes to forming the image the public have of organisations' and companies' efficiency.

Standard language is used in accountancy concerning procedures that can present complex corporate situations through just a few measurements. Following the Commission Recommendation of 30 May 2001 on the recognition, measurement and disclosure of environmental issues in the annual accounts and annual reports of companies, C(2001)1495; its incorporation into Spanish law was accompanied, in 2002, by the drafting of the *White Paper on Accountancy Reform* and the adoption of the International Financial Reporting Standards (IFRS).

The accounting system has met with unquestionable success in providing summarised figures that are widely used and considered representative of the company's actions, at least in the financial area. This is the case for *profit/loss, assets, capital and reserves* and related measurements, such as *profitability* and *indebtedness*, which have become terms used in everyday speech.

Accounts now act as an element that guarantees transparent information and, ultimately, ensure that the financial markets operate efficiently by providing the financial markets with information that is useful for agents' decisions.

This situation is putting pressure on two areas for the development of accounting methods: incorporating environmental aspects and taking responsibility for the reliability of accounting descriptions and the communication of them.

Incorporating environmental aspects

The argument is straightforward: if the price system acts as a regulating mechanism in the market for the allocation of resources, let us ensure that market prices include environmental costs and not just private costs, so as to regulate environmental resources just as efficiently. Below we will look at the set of difficulties this involves in the various stages of the accounting process described.

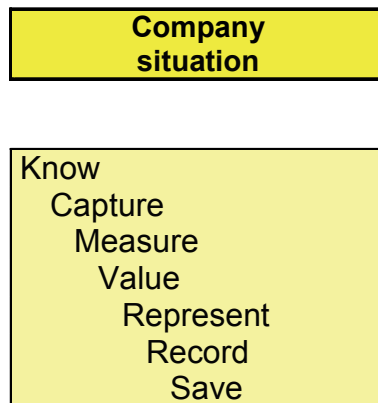
Taking responsibility for the reliability of accounting descriptions and the communication of them

There is always concern about the accounts giving a “true and fair” view. There are regulations governing the standard of communication to ensure that the issuer and the recipient of accounting information are speaking the same language. Information is included in the form of reports by independent experts (auditors) in order to provide evidence that a true and fair view is provided and so improve the information’s trustworthiness.

This all results in a context in which there is growing awareness that the environment is a scarce resource and that, in addition to a flow of products produced for sale, the company’s business includes polluting emissions and waste generation in the process of producing, distributing and consuming them as well as when the product is disposed of at the end of its useful life.

4.3.1. Accounting principles and the environment

We have mentioned different stages in the accounting process, which are listed below, to summarise the difficulties involved in incorporating environmental variables. You will undoubtedly need to look further into this, beyond the scope of this section.



Know:

- The accounting point of view focuses on the legal unit: the company. We have mentioned the submission of consolidated accounts and the International Financial Reporting Standards.
- The effect of tax can be seen in more than a few considerations concerning accounting aspects. An environmental tax would surely be quickly reflected in annual accounts.
- A tendency to explain the past.

Capture:

- A vision targeted at a particular social group: owners (capital and reserves, dividends, etc.)
- It treats the company’s impacts on other social groups as an expense (staff, tax, social security and also environmental costs).

Measure:

- A tendency towards objective measurements. Building a profit in order to pay it out as dividends requires a reasonably prudent approach. This justifies the principle of prudence.

Value:

- This needs to be done in order to be able to carry out the subsequent aggregation of figures to form the accounting statements. Recording all of the company’s activities in Euros is a

necessity, which together with the search for objectivity, gives rise to the historic price or acquisition price principle. In other words, valuing everything at the market price at the time it was acquired.

Bear in mind that there is no market for many environmental goods and they may not even be able to be bought, but rather simply enjoyed (scenery, air, etc.).

These may appear to be insuperable difficulties, but we can all agree that environmental impacts make their presence felt in the company's financial figures, both directly and more indirectly. For example:

- The financial effect of eco-taxes and provisions as part of the product's cost.
- The risk of reducing the useful life of assets due to pressure from social agents.
- Increasing outgoings in order to tackle environmental needs. Additional equipment, complying with legal regulations, etc.
- Increasing outgoings due to eco-taxes: "the polluter pays".
- Increase in provisions for repairs and restoration.
- Changes in behaviour by the company's partners: "Green buying".
- Transferring liabilities in sales and mergers.
- Transferring liability as a result of selling businesses and creating patents.

This makes it more appealing to record environmental aspects in the accounts.

A place may be found for some of these variables in the accounts in view of the ICAC Decision of 25 March 2002, approving the rules for recognising valuing and reporting environmental aspects in annual accounts (Official Spanish Gazette of 4 April 2002), which follows the EEC Recommendations (OJ L 156/33 of May 2001). This Decision requires Spanish companies to apply these rules on a compulsory basis, and follows the concepts developed by the European decision, which were voluntary. In order to apply each country's regulations, one must follow the instructions issued in each of them, and if they have not been implemented, one can use the EC Regulation (annex 5).

4.3.2. ICAC Decision on recognising, valuing and reporting environmental aspects in companies' annual accounts (Spanish Official Gazette of 4 April 2002)

This rule imposes an obligation, in annual accounts, to carry out the "recognition, valuation and reporting of environmental matters that may be necessary in order for individual and, when applicable, consolidated annual accounts to show a true and fair view of the net equity, financial situation and profits/losses of the organisation the accounts concern".

This rule is compulsory for all organisations that must produce accounts, whether individual or consolidated, companies and non-profit organisations, as well as SMEs.

The Decision breaks down into the following ten rules:

1. Scope of application.
2. Valuation and reporting of environmental matters.
3. Definitions of activities and the environment.
4. Environmental expenses. Ordinary and extraordinary, recurring and non-recurring.
5. Environmental assets.

6. Environmental provisions and contingencies.
7. Compensation receivable from a third party.
8. Long-term obligations to repair the environment.
9. Information to be provided in the report.
10. Accounts to be used to record environmental effects.

The ICAC regulation of 25 March 2002 should be framed within the context of the set of actions and proposals that lead to better perception of environmental information by all of the decision-making agents, since there is a clear need for the necessary information about systems' environmental behaviour.

Transparent reporting creates value for a company. The legal provisions concerning accounting information effectively describe a company's financial flows and economic activity. The annual accounts are part of the set of information widely available to all people interested in the company's development.

Technically speaking, this description is influenced by the appearance of environmental and social aspects that are forcing people to redefine concepts. Take for example a negative residual value: the company will pay more to get rid of the equipment it does not wish to use and repair the environmental situation.

More generally speaking, the risk arising from poor management, which a company can hardly tolerate, is insufficiently described and has a direct effect on the financial side of things.

Given the serious problem of environmental pollution, it is always possible that the solution could involve stopping the activity causing the pollution.

This regulation provides a definition of environmental activity as "any operation, the main purpose of which is to prevent, reduce or repair damage to the environment".

Recording environmental activities in the accounts is set out in terms of converting them into an expense, regardless of whether it is paid, and makes it possible to recognise future implications and payments attributable to the period being described. It considers and uses the accounting system to show the "environmental contingencies" caused by the company's action.

The impacts are described differently in conventional accounts when they come from within the company. Some of them are visible and are recorded by the accounting system because they affect present or future monetary measurements (expenses, costs or provisions). Other measurements explain the behaviour of financial figures and are not included in the purchasing system as there is no appropriate metric in the cause-effect relationship, such as intangibles (reputation, market position, the knowledge the company's social partners have of it, green purchasing commitments, etc.), which are a reference point, but are not described by the accounting system.

The accounts also include a distortion in the concept of consumption, since they do not differentiate the saving component (reduction in purchases) from total consumption. These reductions often arise from recycling and reuse, as well as reducing consumption.

The drive towards developing descriptive models that incorporate accounting principles that are widely accepted and separately record these concepts is a challenge and there is an increasing responsibility to research and study it. It is not enough to internalise certain costs; you need a full description that shows the opportunities that incorporating environmental and social measures provides, whether tangible or intangible.

It is worth making an effort to have models that separately identify the benefits and costs, which determine an "environmental result" and a "social result" in order to clarify and assess the economic,

environmental and social profitability of company projects. It is a model that covers the cost and benefit variables at the three levels mentioned:

- Visible, which affect the company's financial system.
- Separate recognition of savings and risk reductions.
- Measuring and assessing variables that are not easy to measure in the financial setting, which are known as intangibles.

The accounting regulations currently limit the recording of all of these aspects.

They consider the following entries:

On the balance sheet:

- Environmental assets.
- Environmental provisions.
- Long-term repair obligations arising from environmental matters.
- Other obligations.

In the profit and loss account:

- Environmental repairs and conservation.
- Environmental services.
- Environmental losses.

In the annual report:

- Including a mention in the valuation principles section.
- New section of the report.

As far as definitions as concerned, the ICAC Resolution clarifies the concept of an environmental expense, which is specified by the foregoing regulations in the following terms:

“Environmental expenses”

“1. Environmental expenses are the amounts accrued from environmental activities performed or that are to be performed in order to manage the environmental effects of the company's operations, as well as those arising from the environmental commitments of the accounting entity. These include the expenses caused by preventing pollution related to current operational activities, treatment of waste and dumping, decontamination, restoration, environmental management and environmental auditing.”

Different kinds of expenses should be recorded, including:

- Prevention of pollution arising from operational activities.
- Waste treatment expenses, and compliance with the commitments that the company has made regarding the handling of its waste, minimisation plans, reuse, policies concerning the sale of secondary materials and by-products, and final waste disposal.
- Expenses due to land decontamination, waste water, atmospheric impacts, odours, noise, etc.

Although this is rather important, there is a difficulty in applying it, which raises doubts about whether different companies would follow the same criteria. This concerns the need to identify the flow as environmental. It is not easy for the “environmental” label to cover all of the implications of the company's business when the environmental side is part of many routine and conventional operations in the production process. It is not easy to separate the values.

The way in which the regulation treats the expenses arising from the company's environmental commitments is of particular interest. They include both the commitments arising from applying a regulation and those arising from the company's environmental statement.

The same regulation says that it is necessary to recognise environmental responsibilities in the accounts in order to give a true and fair view in the annual accounts. The stated obligations thus have three sources:

- A legal or contractual provision.
- An implicit or tacit obligation, which arises from the expectation the company has given third parties based on its attitude towards protecting the environment, which the company cannot shy away from. Such an expectation is deemed to have been created when the company has accepted an environmental responsibility in a public statement or it has traditionally accepted such responsibility.
- The probable changes in environmental regulation, in particular, government bills and proposals, which the company cannot shy away from.

The first source of responsibilities is clear enough. The legislature introduces the next two, which are not quite so clear. They require an explanation of what the relevant entries record. Do not forget that they are expense accounts and therefore result in lower financial results.

The subjectivity involved in estimating the responsibilities attributable to the company is connected to the situation of recognising the blame that should be attributed when a provision is made for environmental reasons.

The difficulty of assessing these "clearly identified" entries is plain to see. Space must be made for them in section 4 of the annual report concerning the valuation rules so they can be explained or their scope understood. It is worth highlighting this sentence from the legal regulation:

"The uncertainty involved in determining this amount is no justification for failing to recognise it. When it is not possible to produce a better estimate, the possible amounts of expected future expenses should be estimated and provision made for at least the minimum estimated amount. This information must be supplemented in the annual report, in which the exceptional reasons for this situation must be mentioned, among other matters."

Even though this regulation represents progress in terms of recognising environmental impacts in accounts, it is a partial step limited to expense and cost aspects, and it overlooks aspects that create benefits. Furthermore, it requires the company to volunteer recognition of responsibilities arising from expectations its statements may have created.

Even so, consideration of a company's relationship with the environment cannot be limited to the cost factor. It is not sufficient to describe the expenses paid or to be paid due to the company's business. It is necessary to consider the benefits that the company will gain as a result of environmental management, such as:

- Improvement to processes, which apart from getting rid of or decreasing undesired environmental impacts reduces the company's environmental risk (and the liability of its directors).
- Reducing expenses: energy consumption, packaging or the volume of waste, among others.
- The savings obtained by reusing ingredients instead of buying them.

Following the accounting principle of "prudence" introduces a bias in considering the result from environmental action, which is similar to the bias in creating entries on the financial balance sheet. It is not fair to give priority to the cost aspect. The aforementioned principle of prudence requires the recording of any kind of cost as soon as it is known or may possibly be incurred in the future. On the

other hand, benefits are not recorded until they are definite. Applying the principle of prudence creates an asymmetry between income and costs.

The way the environmental result is calculated in the accounts is not designed for payment of dividends and concerns the needs of the government budget; as a result the principle of prudence is unnecessary.

It is worth having other indicators that show all of the impacts, without losing sight of the fact that the best environmental benefit is preventing and avoiding the impact. It would be hard for the prevention expense to become a good indicator of the environmental damage avoided.

To sum up, we can conclude that applying the current framework for accounting records is a starting point to which further elements must be added, further indicators aimed at presenting environmental costs and benefits with a prevention-oriented focus. There is a possible response to this, as we will see in section 4.7 of this chapter.

4.3.3. The environmental section in the financial report

The pressure on the current accounting system to include environmental aspects is creating a lively debate: should we modify the accounting records to include the environmental side or rewrite the accounting system in an environmental way? This debate is similar to the one that took place when the value of the staff began to be included, which is still going on regarding the inclusion of the value of intangibles and knowledge management in particular.

From an environmental point of view, one wonders whether it is possible to extend the scope of the book profit/loss and the financial position recorded in the accounts to include environmental aspects without making the accounts less effective as accounts, so as to transfer the successes of financial accounting to environmental accounting and, ultimately, to the company's environmental management.

If one takes a strictly financial, one might say classical, position, the relationship between the company and the environment leads to the following question: is it possible to reliably describe a company's economic-financial position without taking the environmental side into account?

The responses to this include the one from the Institute of Accounts and Accounts Auditing (Instituto de Contabilidad y Auditoría de Cuentas - ICAC) on 25 March 2002, which has been quoted above.

As could hardly be otherwise, the elements recorded in the accounting statements in the balance sheet and profit and loss account must be described in text in the annual report (on the accounts) in order to express the full extent of the environmental effect on the financial area.

The legislature has also opened up the possibility of companies setting out this relationship in an environmental report by the company.

The ICAC Resolution requires a new section in the report on the annual accounts: section 22, "Environmental information" with the following contents:

"...in which the following information, among others, must be succinctly provided:

- a) Description and features of the most significant systems, equipment and facilities incorporated in the tangible fixed assets and environmental protection and improvement, stating their nature and purpose, as well as their book value and the relevant accumulated amortisation, whenever it can be separately determined.
- b) Expenses incurred during the financial year, the purpose of which is to protect and improve the environment, differentiating between ordinary and extraordinary expenses, stating their purpose in any case.
- c) Risks and expenses for the relevant provisions for environmental actions, in particular stating those arising from legal action in progress, compensation and others; the following must be stated for each provision:
 - Initial balance
 - Additions to provisions
 - Uses
 - Final balance
- d) Contingencies related to environmental protection and improvement, including risks transferred to other companies, the estimate assessment system and the factors it depends on, stating the possible effects on net equity and the profits/losses. When applicable, state the reasons preventing this assessment and the maximum and minimum risks; the operational and financial effects expected as a result of the commitments and the future environmental investments.
- e) The full amount of environmental liabilities and, when applicable, the compensation receivable.
- f) The environmental subsidies received, as well as the income produced from certain activities related to the environment."

This information is accompanied with an explanation of the valuation and estimation principles the company has used, which are set out in section 4, "Valuation rules".

The accounts explained in these sections are account 145 (provisions) and class 6 accounts (expenses) concerning the environment.

"622. Repairs and conservation.

Those arising from holding the goods in group 2 (Fixed assets), as well as the expenses of reduction or repairs for the damage caused to the environment. The latter case includes those arising from the Integrated Waste Management Systems (Act 11/1997 of 24 April and Act 10/1998 of 21 April)." Its development in terms of four digits is as follows:

6220. General repairs and conservation

6223. Environmental repairs and conservation

"623. Independent professional services.

The amount paid to professionals for services rendered to the company. This includes the fees of economists, lawyers and auditors, including environmental ones, notaries public, etc., as well as the commission of independent intermediaries." Its development in terms of four digits is as follows:

6230. Independent professional services

6233. Environmental services

Charges to accounts 622 and 623 are normally paid into account 410, and those to subgroup 57 accounts into subgroup 14 provisions or, when applicable, account 475.

Subgroup 14:

"145. Provision for environmental actions.

Those created as a result of the company's legal or contractual obligations it has acquired in order to prevent, reduce or repair damage to the environment."

The activity is as follows:

- a) It is paid when the obligation or commitment arises, and is generally charged to account 622 or 623.
- b) It will be charged:
 - b1) When the provision is applied, and generally paid into the subgroup 57 accounts.
 - b2) When there is an excess provision, it is paid into account 790."

4.4. CORPORATE SOCIAL RESPONSIBILITY

Companies that have a clear, well-defined sustainable character understand the relationship between the environmental and social results, their company business and the financial profit/loss, and learn how to manage that relationship by identifying the main drivers behind the creation of integrated business value.

Sustainability is all about determining the effects of a company's business on the triple bottom line: environmental, social and economic profits and losses.

The triple bottom line means that companies must determine:

- Their environmental, social and economic impacts.

- Their responsibilities towards each of their social partners.
- How to manage them.

Transparency is a key matter in enabling companies to develop sustainably, and is also fundamental in building trust.

This new concept is a new challenge for companies. It goes beyond the economic benefit; it is a broader concept. We could say that a sustainable company is one that does not just make a profit, but is careful as to how it goes about it. It does not just take its shareholders or members into account, but also the environment in which their activities are carried out and their employees.

The globalisation of the economy, deregulation and an ever more demanding society are moving the business world towards positions of greater commitment towards society.

Corporate social responsibility and sustainable development are new concepts that companies are introducing in their market strategies and reflect a change in the focus of corporate governance. This change involves considering that business success and creation of shareholder value cannot be obtained solely by maximising short-term economic profit, but with reasonable market-oriented behaviour, plus a need to manage environmental and social risks that have traditionally not been taken into account. Companies need to take into account the expectations of a broader group of partners.

Corporate social responsibility (CSR) consists of companies voluntarily including environmental and social concerns in their commercial operations and relations with the company's social partners. Organisations are regarded as following CSR when they meet the expectations concerning their behaviour among different interest groups. Therefore, a company's CSR can be measured to a large extent by the response the company gives to its social partners' needs.

CSR broadens your corporate vision. In the formulation of business strategies it takes into account the influence of other interest parties in addition to clients and shareholders.

This change can also be seen in the consideration of what a corporate asset is. Ownership of physical assets such as manufacturing facilities is just part of a company's market value, which is influenced by intangible assets such as management abilities, reputation and brand value, human and intellectual capital, and the ability to cooperate with interested parties. These are all assets that have not commonly been included in financial balance sheets.

The main features of CSR are set out below:

- It is carried out voluntarily and goes beyond the legal requirements.
- It involves a great deal of interaction among interested agents. It broadens the corporate vision and includes attention to the expectations of other interested parties.
- The company collaborates on achieving common goals and encourages environmental protection and socioeconomic development in the setting in which it operates.
- Environmental and social aspects are taken into account in business decisions.
- The company becomes economically more competitive.

CSR is an essential part of a company's contribution to sustainable development and transparent information is an underlying need arising from the trust required between the company and its social partners.

A new communication instrument has appeared in this context: sustainability reports. These have been shown to be an important tool in providing information and responses to the various players related to the company. These players are calling for greater transparency and commitment to integrating sustainable values in the business world, regarding both communication and integration of sustainable variables in decision-making.

If a company's sustainable action is intended to help maintain and improve its image, the action must be reported. This has led companies to draw up sustainability reports, which make it possible to assess and report the efforts it is making for its interest groups.

Support to creating a framework of general acceptance for the publication of sustainability reports is continuing to grow as fast as the need to have a reporting standard. The rapid growth of the *Global Reporting Initiative* (GRI), which in just a few years has gone from being a risky idea to being a "permanent new global institution", reflects the overriding value many sectors of society give to these frameworks, based on inclusiveness, transparency, neutrality and ongoing improvement, which have made it possible to give concrete shape to the concept of "corporate social responsibility".

4.4.1. Sustainability reports

A sustainability report can be defined as a voluntary, public report, which companies offer, from their corporate position, to parties interested in their activities related to the three dimensions of sustainability. It is the report in which they seek to set out the company's contribution to sustainable development.

The more committed it is, the greater the company's need to produce sustainability reports, both due to the commitments voluntarily undertaken and the obligations stipulated by law. There is a need to provide a more detailed, broader explanation of the achievements and description of the environmental behaviour and environmental responsibilities undertaken by the company and, by extension, the company's social responsibilities along the lines laid down by the *Green paper: Promoting a European framework for Corporate Social Responsibility* (July 2001). This deals with companies' desire to include social and environmental concerns in their commercial operations and relations with their partners.

The *Global Reporting Initiative* (GRI), which is widely supported and is seeking to become a benchmark, has grown out of the need to provide a broader explanation of the company's environmental efforts and actions. Its purpose is the development of sustainability reports, going beyond environmental reports, in a harmonised manner, boosting social and environmental reporting to the same level as financial reporting.

Companies' sustainable development reports are an important instrument to respond to the various players related to the company. These players are calling for greater transparency and commitment in integrating sustainable values into the business world, both regarding reporting and the inclusion of sustainable values in decision-making.

In 1997, the *Global Reporting Initiative* (GRI) began to design a global, functional guide to producing corporate sustainability reports, seeking to create a common work structure that covers the three aspects of sustainability: environmental, social and economic.

The Guidelines produced by the GRI are not a code of conduct, but can be used to support the adoption of a particular code.

Their main objective is to promote international harmonisation in the production of reports that contain relevant and credible information about sustainable actions, to improve the decision-making process.

The reason behind the desire to make this proposal a standard is to ensure that sustainability reports have the same level of acceptance and general practice as financial reports.

A report is more than the sum of economic, environmental and social information. An effort must be made to integrate these different kinds of information so that readers understand the interrelationships between the three dimensions, within the scope of a process (how decisions are taken) and regarding the results.

The principles the Guidelines propose for drawing up sustainability reports are divided into four groups:

1. Transparency, inclusiveness and auditability

These form the framework of the report. A full setting-up of the processes, procedures and suppositions involved in drawing it up are essential for its credibility. Transparency is part of exercising corporate responsibility, since it implies a clear and open explanation of their actions to people who are entitled to ask or have reasons for doing so. The principle of inclusiveness is based on the premise that interested parties' opinions are essential to draw up a report, both directly and indirectly. The principle of auditability refers to the ease of accurate verification by people inside and outside the company.

2. Completeness, relevance and sustainability context

These three affect the decisions concerning what to include in the report. All information of interest must be presented in detail, within the limits set. The principle of relevance is defined as the importance the data have in users' decision-making processes.

The sustainability context explains, on the basis of a context, how development within the organisation affects training and a reduction in economic, social and environmental capital at local, regional or global scale.

3. Accuracy, neutrality and comparability

This is intended to guarantee quality and truthfulness, the minimum possible degree of error and the lowest margin of error; it shows the quality and quantity.

The principle of neutrality refers to an impartial and objective explanation of the development of the aspects set out in the report.

The principle of comparability protects the guarantee that the reports allow comparison with actions in different stages by the same company and with other companies.

4. Clarity and timeliness

These affect decisions about access to the report.

There is no primary user for these reports, who already has some knowledge of what he/she is going to find, unlike accounting reports - for which the primary users are investors.

There is a great need for clarity in sustainability reports, since not all groups of users have the necessary level of experience and knowledge to be able to read and understand them properly.

The essential points set out in the Guidelines are as follows:

- *Introduction and identification*
Statement of principles and presentation by the chairman.
- *Vision and strategy*
Setting out the company's vision and strategy concerning its contribution to sustainable development.
What is most important? How have interested parties been included in identifying these commitments? How are these interests reflected in the organisation's values? How are they included in the corporate strategies?
- *Profile*

Name, activities, operating structure, description of the departments, nature of the markets, legal form, etc.

- *Report scope*

Structure of governance and management systems; structure of governance and commitments; overall policies and management systems, among others.

- *Index*

Finding your way around the report.

- *Action indicators in the three areas.*

In these aspects of the sustainability report or, as an integral part of it, in environmental reports, success will always depend on the indicators they are made up of, so it is worth going into the indicator's attributes.

The economic aspects of sustainability are related to the impacts that an organisation has, and should not be confused with financial-accounting indicators. Economic indicators go beyond describing monetary flows; many companies are still in the process of developing them efficiently.

4.5. INDICATORS AND INDICATOR SYSTEMS

The indicator is the basic unit of the environmental information system with regard to both the company's internal management and reporting.

An indicator is a snapshot of reality. As such, what it tells you may be distorted by the observer's indications and method, the way in which the snapshot is taken and measured, and also the manner and expression through which it is reported.

The elements of which they are made (the method, the way they are gathered, measured and presented) are particularly relevant when it comes to determining social, environmental and financial indicators. These are elements that condition the information provided by the indicators, to the point of calling their validity into question. Even so, we need to set out indicators structured in the form of a balanced scorecard to enable company management.

These structured indicators do not restrict its usefulness to the sphere of internal control but, on the contrary, are the basis for reporting, explaining the company's behaviour to those in society who are interested.

The data reporting function requires a standard, a language that is common to the issuer and the recipient of the message and makes it possible to compare the different company's that release information.

There are different kinds of indicators and different options for classifying them. We will particularly take the following into consideration:

- **Meters:** indicators that measure the position of a figure (for example, wind-speed).
- **Accumulators:** indicators that show how one figure behaves over time (m^3 of rainfall per month).
- **Relationships (ratios):** indicators that measure two or more figures related through a cause-effect explanation (such as the perceived environmental temperature; an indicator made up of temperature and humidity components).
- **Alarms:** they show the position of values of a particular figure using a particular interval as a benchmark. In particular, these are indicators that only provide information when the figure being observed exceeds the values of the interval set (such as a low-fuel light in a car).

An indicator that is analysed in isolation must comply with the set of characteristics set out below, in addition to those arising from connections with the rest of the indicators considered. It is especially worth avoiding the effect of redundancy (all the indicators say the same) and the originality effect (only this indicator deals with x).

4.5.1. Indicator requirements

Any indicator must be:

- **Sensitive:** sufficiently subtle to record the changes in a selected variable so that it is of interest.
- **Reliable:** the distance between theoretical modelling and monitoring of reality must be as small as possible and desirable.
- **Stable:** both the process of gathering the necessary data for the indicator and the stability of the measurement, calculation and presentation criteria.
- **Operational:** there must be the necessary information (which is verified and reliable) to express it or, at least, the means to obtain it.
- **Simple:** in order to avoid mistakes and the possibility that it might be used by different groups of users without having too many problems with specific technical knowledge.
- **Aggregable:** as far as possible, in order to avoid being flooded with information.
- **Comparable:** both in a geographical sense (the entire industry) and in terms of time (changes in the indicator in different periods).
- **Publishable:** an aspect that it is difficult to get right, concerning the difficulties of obtaining information, the cost of such action and how confidential the result is for the company.

The indicators are often accompanied with graphs that aid understanding of them and show how they have changed over time or how they relate to other indicators.

It is of particular interest to classify indicators by time and group them into three categories: predictive, normative and explanatory. This concerns the different ways in which an indicator can be used.

Predictive indicators	Normative indicators	Explanatory indicators
Predictive indicators are those that focus on explaining facts expected to happen. They are of particular interest in explaining activity impacts and projects.	On a particular time horizon, these refer to values that the person taking the decision wishes to accept and are often imposed on the organisation as objectives and benchmarks for their activity.	Aimed at highlighting the importance of different causes in the results obtained.

We can distinguish between these other kinds of indicators based on the scope of communication:

- **General sustainability indicators:** designed by bodies above company level. The company takes a position regarding these figures.
- **Specific indicators** for each product or production centre that is part of the company. Their function is to assess lines, programmes, action and services individually.
- **Participation level indicators.** These measure the level of commitment achieved by involvement within the scope covered by the indicated measures.
- **Indicators of the degree of compliance with the environmental policy.** These state the progress achieved towards the objectives the company has set concerning the environment.

4.5.2. Indicator systems

An indicator has practically no effect unless it is accompanied with others that systematically complement, broaden or explain it with a different level of detail. The group of indicators related to one another is known as an indicator system.

In order to be useful in management control, i.e. in studying, monitoring and controlling projects throughout their performance, any indicator system must meet the following requirements:

- **Complete:** *it defines all of the (significant) relationships to be managed, company/environment relations in our case.*
- **Balanced:** *it offers the same information about favourable aspects as about unfavourable aspects. More information can be provided voluntarily if it is published periodically, in which the emphasis on the details may differ from one year to another.*
- **Explanatory:** *it makes it possible to see cause-effect relationships between the activities and the impacts produced.*

As far as the group of indicators is concerned, it is possible to have synthesis indicators, i.e. indicators that bring many cause-effect relationships together in a calculation or expression, which can be analysed separately through other indicators in a greater level of detail (analytic indicators), whether in terms of time or space, or through a smaller number of cause-effect relationships.

A good example of a synthesis indicator is the figure for the company's profit/loss (book profit/loss). By itself it only involves two figures: the total income and the total expenses. Anyone could list a large number of coefficients, ratios or indicators that explain aspects of this indicator (sufficiency, profitability, composition, etc.).

In terms of management and supervision, of both financial and environmental elements, the company sets up a monitoring and control indicator system with good connections to budgetary accounting and cost accounting, more for the purposes of internal control of the company's business.

A set of indicators is used as a monitoring mechanism tool, to assess all of the actions involved in implementing the plan (financial or environmental).

The indicator system has several kinds of indicators, but in all of these it is necessary for them to show measurable facts and point out quantitative and qualitative aspects that help assess the actions. They must be relevant, representative, easy to obtain and interpret, sensitive to change and must provide comparable results.

When putting an indicator system together, it is worth precisely defining the way in which you will calculate each of them, their time period, the data needed to make them understandable and the sources of the data. The person responsible for forming and maintaining this indicator system will be defined.

It is good practice to write a descriptive file of each indicator containing the following elements:

Description. A brief summary.

Type. According to the conceptual framework of the indicator system.

Initial value. In order to carry out monitoring.

Calculation system. Mathematic formula and graphical representation.

Data source. The bodies that can provide the data.

Calculation frequency and data updating. This varies depending on the kind of indicator.

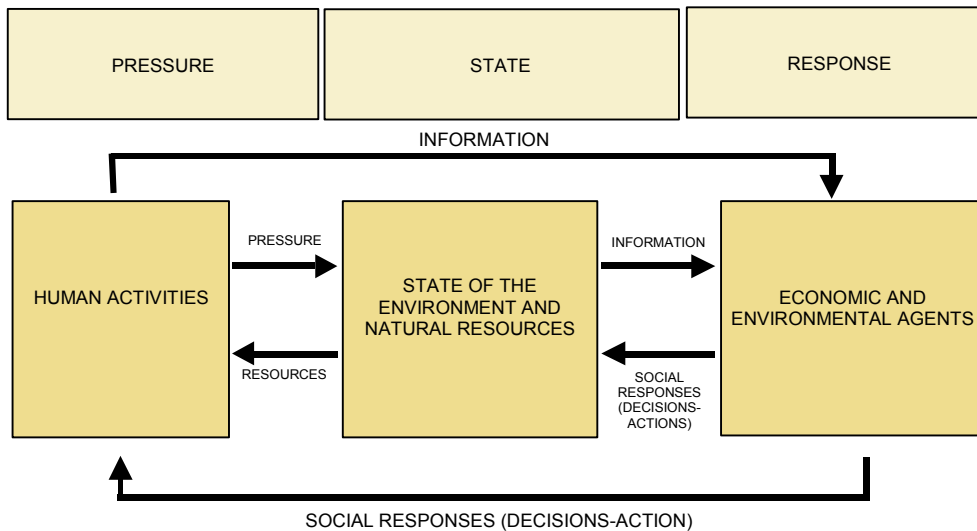
Desired trend. Whether it is necessary for it not to vary or for it to be lower or higher.

Indicator system model: pressure, state and response (PSR)

Considering your company as an organisation immersed in a broader environmental context, in constant interaction, enables you to adapt the pressure-state-response model promoted by the OECD to the environmental field.

This model considers any organisation in situations in the physical environment that condition its actions. These elements have a value and expression at a given time. They are described in terms of state indicators.

This relationship is affected by different practices, traditions, and cultural and technological limits that are a true force for modifying the state of the company/environment relationship.



Pressure-state-response model (source: General Department of Environmental Education and Quality).

The current situation in a relationship is characterised, in accordance with this methodology, by a series of direct and indirect pressures, which affect the relationship (pressure indicators). These pressures affect the quality of associated means and resources, favouring initiatives and proposals that are response indicators that represent the effort to overcome the pressure received.

The organisation, in this case the company, although it can be extrapolated to any decision-making unit (public authority, state, body or organisation) knows the position and forces pushing in a particular direction, takes its decisions and modifies this relationship of forces or the initial position of the state.

This action is measured by so-called response indicators.

The company needs to have a system to gather information to feed the figures gathered by the various indicators. The similarities to an accounting system are pretty clear, but there are two notable differences: the double-entry principle (recording the sources and uses of each entry) is not applied, and, secondly, but no less importantly, a monetary valuation of all of the figures covered by the indicator system is not necessary. Even so, the term environmental accounting is accurate, at least for recording the spirit of “what is not known is not managed”, and the periodic form of updating, for both internal and external use.

We will group the indicators that the company’s information system is finally made up of into three blocks: state indicators, effort indicators and performance indicators.

Environmental state indicators (ESI):

This group of indicators is aimed at describing the general environmental impacts associated with the company’s activities. They provide information about the quality of the surroundings, the state of the environment at the company’s site or in larger geographical areas.

These indicators are characterised by having a vision far above company level and are very useful in focussing organisations’ attention on environmental aspects applied to their most significant impacts.

The state of a quality gathered by an indicator is associated with the problem linked to that figure (aquifer exhaustion, land pollution, desertification, etc.), which depends on a large amount of variables

and different agents. The indicators describe and measure this situation and make it possible to focus the company's efforts and its environmental policy statement.

Effort indicators (EI):

These describe the management efforts aimed at facilitating and providing the company's activities with the necessary infrastructure for successful management.

These concern specific training areas regarding the environment, incentive systems, audit frequency and non-conformities, among others.

They are aimed at developing internal objectives and policies. These indicators are closer to the company's internal management and are not designed to establish an external reporting mechanism for the company.

Environmental result indicators (ERI):

These show the key aspects of the company's business concerning the products, processes and services it has. They cover emissions, spills and dumping, recycling, reuse, movement of goods and energy use, among other possible core matters concerning the company's actions.

These indicators can be divided into two groups: flow indicators and infrastructure and transport indicators. These indicators are, by themselves, a relevant instrument for data communication in both environmental reports. As stated in the EMAS Regulation, they often include environmental costs and their monitoring.

These three categories of indicators are aimed at achieving three different objectives:

- The company understands the consequences its business has for the environment (ESI).
- The company take appropriate measures to ensure the best possible management of the environmental impacts its business generates (EI).
- The result of the environmental management is described in terms of listing the objectives the company has set and their degree of achievement (EMI).

Take for example indicators concerning a common matter in most companies: generation of industrial waste (IW).

Title: Generation of industrial waste

Description. Intensity of IW production in the industry:

It estimates the intensity of IW production based on the total production of waste in the industry (declared to the Waste Agency) in relation to the industry's GDP.

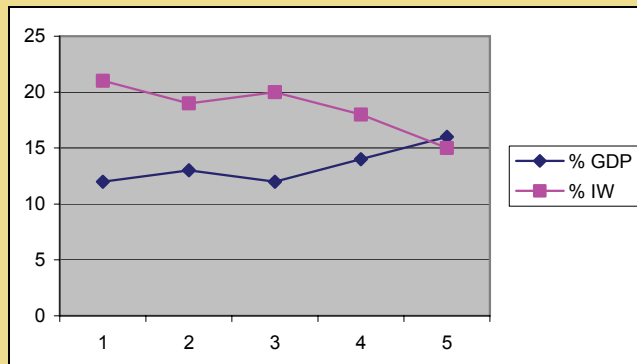
Type. State indicator. Initial value. 12% in 2002.

Calculation system. The industry's GDP as a percentage of total GDP divided by the industry's IW as a percentage of total IW.

Data source. Waste Agency and Chamber of Commerce.

Calculation frequency and data updating. Half-yearly.

Desired trend. Improvement (growth) in the index.



Title: Packaging safety

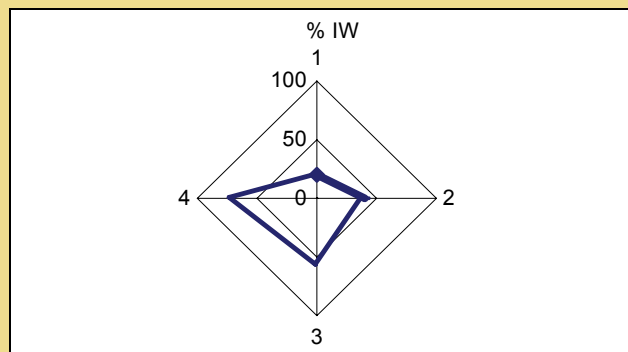
Description. New safety regulations concerning the transport of the product, which involve more safety measures and the possibility of reuse.

Type. Pressure indicator.

Initial value. 12%

Calculation system. Percentage sales of products with packaging checked to make it suitable and maximise reuse of packaging in relation to the total number of sales.

Data source. Accounts Department and R&D Department.



Calculation frequency and data updating. Quarterly.

Desired trend. Upward trend (until unity or all products are reached).

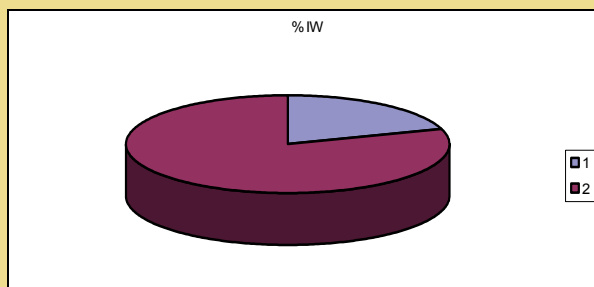
Title: Reuse of packaging

Description. Reuse of packaging from purchases.

Type. Result indicator.

Initial value. 12%

Calculation system. Amount of reused packaging from purchases as a proportion of the packaging used.



Data source. Department of Production and Purchasing Department.

Calculation frequency and data updating. Quarterly.

Desired trend. Upward trend (until unity or all products are reached).

From time to time, the company should review whether it is worth carrying on using the indicators it has created.

In order for an indicator to continue to be used, the following questionnaire must be answered in the affirmative:

- 1) Do the indicator's data show the company's environmental impact trend?
- 2) Do the data gathered by the indicator allow environmental objectives to be quantified?
- 3) Does it enable comparative analysis of change in the most recent periods?
- 4) Is the information sufficiently clear as to not require help from an expert?
- 5) Is it possible to make comparisons with legal rules or companies and industries?
- 6) Does it provide non-redundant information?
- 7) Is the subject matter described significant?
- 8) Is it sensitive to changes in the company's behaviour?
- 9) Is it the best way of describing the subject matter?
- 10) Do we have sufficient information? (Sufficient quality and trustworthiness)

4.6. THE LIST OF ENVIRONMENTAL DEFICIENCIES/IMPROVEMENTS. FINDING SYNTHESIS INDICATORS

In order to manage something you obviously need to have a degree of control over it; this implies knowledge of both its position and the response to the decisions that affect it. In the environmental field, it is necessary to measure and then analyse the company's actions in that regard. Environmental indicator systems play an important role in that, In particular environmental cost indicators.

The scarcity of means that can be included in systems that complement existing financial ones, especially in small companies, should be no obstacle to as full a description as possible. Even when it is scarce and of limited accuracy, it is always better information than information you never have due to not having the means to gather accurate information.

One could say that a quick, partial and simplified view is more effective than late, more expensive, modelling with impeccable levels of accuracy. Consider the idea that few variables explain a lot of company behaviours.

It is a matter of identifying these variables and progressively expanding the scope of the impacts caused. When you sacrifice the accuracy of the end results in order to obtain approximate values, you also need to do two things:

- a) Explain the hypotheses and limitations on the indicators or the available information.
- b) Make them more consistent by using the same criteria for determining indicators and figures so that it is possible to compare them over time, and show how the factor has changed without bias.

Note how the initial implementation of an environmental impact indicator system in a company is a way of motivating staff, as well as an element that describes the mistakes being made in everyday tasks and behaviour. The general management's support is needed to successfully see the task through, and more than a little skill is required to push through possible changes to routines.

Once again, the interaction between social and environmental aspects is clear to see.

When the environmental indicators are selected based on a particular theme, the company needs to know the two kinds of information set out in this table:

External	Internal
How does the company affect the environment in the place or region it is in? What specific rules affect the company's activity in its location? What are the environmental variables of concern in the company business' area of influence?	Which environmental actions are the most important? Which are the most urgent? Which would we have most success with? Which would lower financial costs? Which would create income?

When you are selecting a system indicator, it is worth asking the same questions as in the indicator validation questionnaire (see page 95).

The description achieved by using the indicators included in the system must have sufficient explanatory capacity to explain the various impacts one by one. However, it must also show the effect of transferring the problem from one area of the company's environmental activity to another. Take for example the case of a company that reduces its atmospheric emissions due to a technological change that increases the production of industrial waste. These interactions will have to be identified as precisely as possible.

A cost/benefit assessment would determine whether this technological substitution is worthwhile from an environmental point of view.

4.6.1. Environmental costs

Indicator	Figures of which it is made up	Accounting system accounts to which they are related					
		643	650				720
I1	M1	X					
	M2						
			X				X
	M		X			X	
I2							

Source: own data

There will surely be figures that are not reflected financially, but one can also be sure that for different environmental indicators we can establish a realistic connection with financial accounting. These indicators are of great importance.

First and foremost, there are two types of costs:

- a) Those recorded by traditional accounts. They refer to an expense, i.e. a payment or commitment made in the company's relations with third parties, most likely through a contract or legal obligation.
- b) Costs that in accounting are or should be considered unconnected to cash flows. Indeed, not all costs to be considered arise from the acquisition decision. The environmental impact of the company's activity generates different costs that have no repercussions on the finances of the companies that generate them. In some cases, the valuation of these repercussions is a poor reference point for assessment.

4.6.2. Environmental accounting

Introducing environmental accounting arising from analysis of the previously selected indicators involves introducing more cost elements in category b) into the costs the company had been considering. This burgeoning of costs need not necessarily affect the value or price of the company's products.

Analysis of this is a way of perceiving the full extent of the problem: environmental and financial and, when applicable, social. In order for competitive advantages to be created, this framework in which the complexity of the company's actions is not limited to the monetary side is necessary.

Obviously, not considering environmental costs (type b) in the calculation of the product's unit price does not mean the cost disappears. The company simply ignores it for the simple reason that it is not billed, at least not directly.

It is worth pointing out that the degree of internal recognition of costs, which we mentioned above, is a responsibility of the company's and a company is perfectly able to set the limits it deems appropriate in terms of its environmental policy. It is not bad practice to work out the product's costs according to the two systems.

The difference in cost may affect decisions concerning company strategies aimed at ensuring the company's survival when there is a change in the legislative context, and achieving competitive

advantages in response to changes in the perception your customers and users are sure to have of the environmental problem.

Environmental costs can be treated in the same way as the rest of analytical accounting costs, analysis of turnover, behaviour over time, breakdown by amount and price, etc. The classification of environmental costs in AECA document number 13 (environmental management accounting) is useful for analysts. It considers two groups of costs: recurring and non-recurring costs depending on how long they last.

There are the following subgroups of recurring costs:

- Costs arising from obtaining environmental information.
- Costs arising from an environmental management plan.
- Costs arising from environmental technological adaptation.
- Costs arising from management of waste emissions and dumping.
- Costs arising from product management.
- Costs arising from administrative requirements.
- Costs arising from environmental auditing.

The non-recurring costs are:

- Costs arising from environmental prevention systems.
- Costs arising from investment in facilities.
- Upkeep and maintenance costs spread over more than one year.
- Costs arising from interruption of the environmental contingency process.
- Costs of environmental accidents.
- Costs of new environmental requirements.
- Image improvement costs.
- Control and measurement system costs.
- Non-payable costs.
- Legal costs.

Moreover, it is worth not losing sight of two aspects in the system of comparable environmental measures set out:

- a) Contingencies. In other words, costs that might end up having an impact on the company's cash (accidents, fines, inspections, etc.).
- b) It is difficult to separate environmental aspects off from the rest of the elements of the company's policy and generation of costs.

Despite its complexity, this vision lacks one of the main appeals of environmental management: the benefits for the company. These benefits may come in the form of impacts saved and, therefore, have repercussions in terms of costs and responsibility, or benefits arising from environmental impact and financial measures. Take for example a reduction in energy consumption per unit, due to reusing materials or energy.

One can go still further in the design of an indicator system in order to cover the two sides and, with a bit of effort, arrive at synthesis indicators, as proposed in the following section.

5. COMPANY 21: SUSTAINABLE BUSINESS MANAGEMENT: MAKING IT PROFITABLE TO BE ENVIRONMENTALLY-FRIENDLY

5.1. INTRODUCTION

A book would be of limited value if reading it did not encourage everyday action. This is still truer if the book concerns the adoption of environmental matters, especially within the scope of agents of great weight and importance: companies, bearing in mind the role of small and medium-sized enterprises.

This last chapter takes up the concept of sustainable development as a new context in which currents of opinion and action are being formed, which are the forces putting pressure on companies. Companies are calling for a clear, well-defined legal framework in international debates and forums.

From a global, interconnected context of multilateral relationships, we need to take a local stance, with an intimate relationship with natural resources, focussing on the level of the business centre in which the environmental measures and actions are best dealt with, which is more pragmatic for environmental improvement action and, by extension, actions to achieve sustainability. In this regard, let us take a look at how Local Agenda 21 (A21) affects companies.

The third section contains some questions to consider in order to examine whether the company's action regarding sustainable development at local scale, within the SME's scope of influence, is on the right wavelength. It contains an action list to help with the last step: moving from consideration to action.

We will finish off the chapter and the publication with quality circles for ongoing improvement of environmental management as an important part of sustainability and a requirement for the company's survival in a world focussing on sustainable development.

5.2. GLOBAL LEVEL: SUSTAINABLE DEVELOPMENT, A COMPANY CONTEXT

The ideas of sustainable development are increasingly being taken up by many institutions and organisations. As it is being widely taken up, it is being defined in different ways and there is a clear awareness that the current situation is unsustainable. Ecosystems are being overloaded, conflicts loom due to the tensions caused by existing inequality and there is a culture of excess in certain regions, in contrast to the objectives and the praiseworthy and possible desires expressed at the Earth Summit (Johannesburg, 2002), which proposed "halving by 2005 the number of people with no access to clean water".

The clear trend towards sustainable development will surely cause tensions in the way in which companies currently behave and do this. Companies must explain, communicate their actions, report their use of natural resources and the degree of resource use both in the companies themselves and in the consumption of their products. The reporting system requires accounting to support the reporting role, informing the company's shareholders and management how to carry out this use of environmental resources. This can be carried out through any of the channels described: including and expanding the current financial scope or getting involved in drawing up a sustainability indicator report that includes environmental indicators (see chapter 4).

Companies' actions in the context of the 21st century pose a new risk: not being sustainable.

In chapter 1 we saw how a company's attitude could be classified within the framework of two extremes we have called "proactive" and "reactive" depending on how the change in the setting (the environmental change) is analysed. We suggest proactively reflecting on this situation:

Catastrophe looms when science or technology classify the product or production process as a major health risk (remember that constant research is being carried out into the environment, since it is a new discipline).

Would the company be able to develop a response?

Will you have a disaster management plan? There is nothing particularly outrageous about having a plan that highlights the aspects of conventionally managing this risk in the various stages involved: prevention, preparation, damage limitation, rapid and appropriate response and recovery from or repair of the damage in relation to the breach of the requirements arising from the new risk: i.e. being sustainable.

The prevention stage is bound up with the knowledge and estimation of the risk of the relationship between the production system and the products produced throughout the life-cycle with the environmental parameters.

You could ask yourself whether the current situation would pass a sustainability test such as the one proposed in the third section of this chapter.

Taking the step from ideas to action has never been an easy process, and business is well aware of these difficulties. One could say that sustainable development is a good idea, a need and a problem, but someone else's problem.

The problem has a planet-wide scale that is beyond the scope of a company's action. It is a problem that requires agreement to be reached between worldwide authorities and there is a need for a global, multilateral framework (open to different partners). The following question therefore arises:

How does it affect my company? What can I do to help fulfil objective "f" from the Earth Summit in Johannesburg (2002)? This objective is as follows:

f) Promote corporate responsibility and accountability and the exchange of best practices in the context of sustainable development.

In addition to all of the complications involved in kick-starting a change in the economic and social paradigm, with all the problems of discussion and definition it entails, a cultural change is necessary, since it ultimately requires some of us to live more simply so that others can simply live.

This process began long ago. The first report warning that economic growth and development must respect the environment was written long ago but is still just as applicable. This beginning was followed by a set of reflections that initially focussed on the environmental side, but are increasingly including social aspects and giving them more prominence. Take for example the following paragraph from the introduction to the summit's plan of implementation:

"Eradicating poverty, changing unsustainable patterns of production and consumption and protecting and managing the natural resource base of economic and social development are overarching objectives of and essential requirements for sustainable development."

Based on a concern about the environment (managing natural resources in the broadest sense of the term), sustainability concerns social and even cultural factors. Three of the five areas debated and agreed on at the Earth Summit are directly related to matters of social behaviour: poverty, protection and health, and changing the patterns of production and consumption that accompany protection and management of natural resources and the globalisation of trade.

Although at planetary scale there are no magical solutions that can be universally applied, the concern remains together with the tension and attention typical of an unsolved problem.

An SME's business appears to be a matter far removed from this debate, but it is not when you look at it more closely, at local scale. The closer you are to a problem the more you can do to solve it. That is the case for sustainability, when you work at local scale, as we will see in the following section.

5.3. FROM GLOBAL LEVEL TO LOCAL SCALE: COMPANIES AND AGENDA 21

In our country matters concerning the environment and sustainability tend to be learnt in a broad fashion, i.e. as a kind of knowledge that is applicable to many decisions and practices concerning technologically solved problems that need to be reviewed. The focus is not on an isolated knowledge area that generates knowledge and is studied by itself. Sustainable development and care for the environment are knowledge areas to be applied and carried out in everyday practice in order to aim at a situation different to the current one.

Local governments have taken up the challenge of sustainability and, adhering to the tradition of "think globally and act locally", they have started Agenda 21 processes, which have rapidly grown and spread.

In brief, Agenda 21 (A21) involves considering the area (municipality and then region) and, following a prior analysis (initial diagnosis), the state of the environmental parameters in the territory is detected in order use a public participation process to draw up and approve economically viable environmental and social action for use as action guidelines for the area's inhabitants (including companies and organisations).

This guide, based on certain targets, enables action plans to begin. It is the start of a path along which its execution is periodically assessed and reviewed at a set pace, with the relevant periodic reporting to the public (inhabitants, companies and institutions). It is a process in which public participation is always involved.

For an SME or production centre in a district in which an A21 process has begun, this is a new ingredient, a new action framework in which it acts in two ways:

- a) As an organisation that is part of the community.
- b) As driving force behind activities related to the environment, which puts the A21 guidelines into practice.

5.3.1. The relationship between the company and Agenda 21

When planning a sustainable strategy, a company can and needs to develop and follow a dynamic model that takes the following parameters into account:

- *The requirements and needs of the physical and geographical setting it is in, and the different needs expressed in Agenda 21, because this situations involves opportunities and threats to the company's management itself.*
- *Competitive environmental abilities. Companies have abilities they can make competitive advantages of, while being socially responsible. They can make them available to the competent authorities in order to develop Agenda 21 projects. In this context, both production centres and SMEs are organisations that may be very important and have considerable influence in achieving significant economic and social participation.*

- *Environmental strategy. Bearing in mind the external situation, the requirements and needs of the municipality, district or region, and the company's internal needs. The company needs to define its environmental strategy, seeking to ensure it is aimed at planning the development and strengthening of its abilities to bring about change and, to a certain extent, influence, helping to form the future outlook for the setting it operates in.*

5.3.2. The relationship between Agenda 21 and the company

When the public authority is planning its strategy to begin the Agenda 21 process, it must clearly and precisely consider the aspects and activities it expects from companies. In order to do this, it will need to typify the companies according to features such as their size, industry, location, position and the relative importance of their activity in the system.

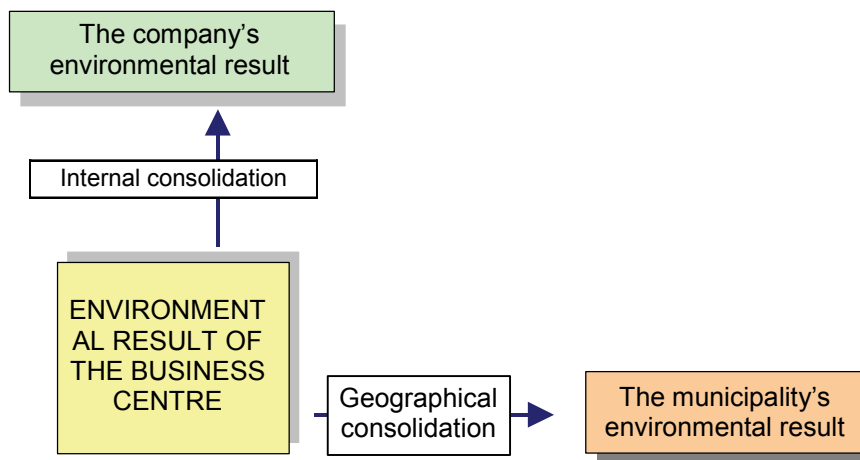
This concern with getting companies involved, as organisations based in the area and affected by A21, must be a methodological constant in the process in each and every one of its stages.

The public authority and the bodies set up to get A21 off the ground need to bear very much in mind companies' abilities to take action regarding matters concerning the environment and sustainability. They need to know how to carry out their development plan and its improvements and benefits, in order to enable joint, participative action in all stages of the process.

The company is thus influenced by a long list of social factors that go hand in hand with external environmental factors. In order to be successful, the company needs to manage these (restrictions) in balance with corporate objectives.

The public authorities, at whatever level, are perhaps the environmental force that has the most direct influence on companies through legislation and legal requirements. The ultimate aim of these provisions is to get business organisations to internally recognise costs, i.e. stop considering environmental impacts as mere externalities. How companies tackle these challenges is important. While some companies will fight the legislation (reactive companies), others will be able to convert the challenges into opportunities (proactive companies - see chapter 1).

Various studies have suggested that proximity to production units is a factor in making environmental indicators effective. Action carried out under the banner of ecological audits is closely connected to geographical location. Therefore, it is a good idea to refer the environmental result, as defined in chapter 4, to production (or service) centres according to their geographical location. We can thus establish a means of consolidating, of aggregating, levels of results in two directions, as shown in the figure below:

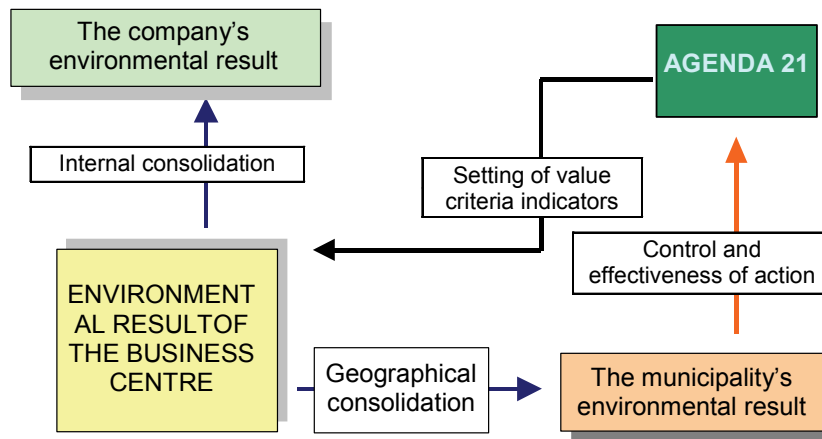


Internal consolidation, within the scope of a legal unit, makes it possible to determine the result in a company that has made an environmental commitment. The second form of consolidation is more difficult, but not therefore of less interest: consolidation within the territorial scope, within the scope of

the municipality, in which the importance of environmental behaviour in the production centre is more closely felt, more important and may be followed and complemented with appropriate municipal action.

It goes without saying that announcing Agenda 21 projects will have significant value in assessing the behaviour of a company's production centre in a municipality that has thus expressed its desire to manage the area sustainably.

The aggregate result for all of the business centres in a municipality will make it possible to control the effectiveness of actions aimed at sustainability. The very definition of Agenda 21 will aid the setting of value indicators for most of the company's environmental and even social impact valuations.



To put it another way: the Local Agenda 21 is a valuation benchmark for the environmental impact of companies' business, and is supported by the publication of the results of the centres located in the municipality, thus completing the basic sustainability triangle: citizen-company-municipality.

5.4. FROM LOCAL LEVEL TO INDIVIDUAL RESPONSE

How does the company's profit and loss account respond to this change? By changing, by becoming less precise but of a broader scope. It is able to quantify the cost/benefit analysis for a company that takes a proactive attitude regarding the environment.

Calculation of the profit/loss covers a wider scope than the description of income and expenses showing the cash flow. New forms of description are arising to record the consequences of the environmental impact. The main sections it should contain (see chapter 3) are in the table below, grouped into four sections:

- a) **Direct consequences of management** that affect cash accounts.
- b) **Future responsibilities** that will have a probable monetary effect in later years. The costs are recorded, according to the principle of prudence, in the provisions accounts. They are not shown in the income concerning this item in the profit and loss accounts.
- c) **Hidden consequences of management.** These are often labelled in income and expense items that correspond to other classifications in which the environmental relationship is relegated to second place. Hidden income is not recognised as such in accounts; they show the consumption after the saving provided.
- d) **Intangibles.** There are not described by the traditional accounting system and their valuation does not arise from monetary records. They exist and are recorded through other facts and together with them. That is why they often go unnoticed. It is possible to identify them, but they are not as objective as accountants require in their description of annual accounts (see chapter 4).

A non-exhaustive list of the items most frequently included in an environmental profit and loss account is shown in the table below:

Environmental results	
Costs	Income
<p><u>Direct management costs</u></p> <ul style="list-style-type: none"> • Facility maintenance (specific). • Waste collection, transport and treatment. • Transport and disposal of rejected products and waste. • Environmental damage insurance. • Training costs. • Information access costs. • Specific taxes, charges and rates. 	<p><u>Direct management income</u></p> <ul style="list-style-type: none"> • Access to new markets in which the product's environmental behaviour is appreciated (green purchasing). • Sale of recovered waste. • Aid and subsidies for environmental action. • Reduction in insurance cost. • Sale of technology or information about the environmental process. • Advice on environmental matters. • Better potential product quality (higher added value).
<p><u>Costs of future responsibilities</u></p> <ul style="list-style-type: none"> • Cleaning up polluted areas • Contributing to cleaning up infrastructure. • Redress and compensation for damages. Health and ecosystems. • Legal costs. 	<p><u>Income from future responsibilities</u></p> <ul style="list-style-type: none"> • Higher value in cases of sale, winding up and merger due to having no environmental liabilities. • Access to financial markets under better conditions (lower risk, lower cost). • Lower provisions for redress and compensation for damage.
<p><u>Hidden management costs</u></p> <ul style="list-style-type: none"> • More production costs to reduce polluting effects. • Cost of measures to adapt to and comply with regulations. • Bureaucratic management procedures (mainly rejected products and waste). • Cost of obtaining permits. 	<p><u>Hidden management income</u></p> <ul style="list-style-type: none"> • Saving on consumption per unit (reduction in use of materials in the product and process). • Fewer expenses from management of rejected products and waste. • Fewer management hours. • Fewer provisions for infringements.
<p><u>Intangible costs</u></p> <ul style="list-style-type: none"> • The company's risk concerning environmental liabilities. • Complicating relations between workers and trade unions. • Negative publicity. • Social opposition to the facilities. • Being left behind direct competitors. • Cost of not acting. 	<p><u>Intangible income</u></p> <ul style="list-style-type: none"> • More motivated staff (lower risk, more comfort, more environmentally responsible). • "Clean" corporate image. • Absence of environmental disputes. • Greater company credibility. • Society views the company and the owners positively. • Greater ability due to knowledge (see chapter 2). • A good position that makes you a cut above the competition.

Source: own data

Are there any doubts about which way the cost and income scales will tip?

It will undoubtedly depend on many factors, but we think that a complete analysis and prudent quantification will make the income outweigh the costs. Always.

5.5. THE ACTION PLAN: A QUESTIONNAIRE SUMMARISING AND STRESSING SPECIFIC ASPECTS OF THIS PUBLICATION

This publication aims to make suggestions and provide guidelines to help businesses identify and prioritise development actions towards sustainability.

Suggesting improvement action you could take helps you think it through, promotes creativity and predisposes you to produce alternatives in the decision-making process (see chapter 2). It becomes a prior step to modifying and improving your company's action.

We are presenting these possible actions and suggest that readers classify them according to how feasible it would be to apply the measure in their company, as well as how they would be perceived, intuition, the economic repercussions for the company and the social repercussions (for which the society would be responsible), which would involve the adoption of suggested actions.

We have added three columns to the list of possible actions, scored on a scale from nought to five. The first column is for the degree of feasibility, the possibility of carrying out this action in the company (production or product), which is scored between two extremes:

- "Score 0", impossible to carry out: this shows that the company's current situation is considered unimprovable. Things are being done as efficiently as possible, with the best technology, and the people who carry out the work know and correctly apply the instructions.
- "Score 5", possible to carry out: the company can definitely improve this aspect by using techniques it is not currently using, improving learning, with better knowledge of what is being done, or improving the attitude of the people carrying out the action.

The second column refers to the perception of the impacts on the profit and loss account that would result from carrying out the activity. The same scale is used and the extremes are as follows:

- "Score 0", situation $C > I$: this shows that there is presumed to be a situation in which carrying out this action would involve more costs than income for the company.
- "Score 5", situation $C < I$: this shows the opposite situation, in which carrying out this action would presumably mean having more income and consumption savings than the costs involved in the change.

The list is rounded off with an assessment of the situation that company is in, like the impacts in the profit and loss account. The viewpoint of the impact on society does not directly affect the company. This specifically excludes corporate image matters. There may be positive (E^+) and negative and unfavourable (E^-) situations. The same scale between two extremes is used:

- "Score 0", situation $(E^-) > (E^+)$: this is the expectation that the impact of the company's action's would have more disadvantages than advantages for the company. The social costs would exceed the income.
- "Score 5", situation $(E^-) < (E^+)$: this is the opposite situation, in which the company's actions would presumably have more positive than negative effects on social repercussions.

As always, the scale from nought to five shows how close they are to each of the situations defined at the extremes.

Sustainable business management: making it profitable to be environmentally-friendly

Action	Possible					Internal impact			External impact									
	A little		Very			C>I	C<I	E>E ⁺	E>E ⁺	E>E ⁺	E>E ⁺							
	0	1	2	3	4							5						
Implementing a system for monitoring new environmental knowledge	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
Assessing compliance with environmental legislation in all projects	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
Implementing an environmental management system (EMS)	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
Producing a sustainability report	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
Making changes to adapt to ISOS and EMAS	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
Minimising waste																		
Sale of by-products	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
Current sale of rejected product																		
Knowing and identifying the externalities produced	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
Boosting innovation and eco-efficiency	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
Sponsoring environmental actions and publications	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
Offering customers advanced ecological design																		
Sale of rejected product	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
Redesigning production processes	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
Redesigning products with reduction in use of materials	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
Smaller packaging	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
Reviewing the energy efficiency of distribution systems	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
Reusing water.	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
Substituting raw materials through reuse	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
Knowing and assessing current environmental liabilities																		
Knowing and reducing the impact through responsibility	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
Improving safety by reducing the accident rate	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
Reducing the risk of using the product	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
Reducing noise levels in the production process	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
New market action plan (green purchasing)	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
Knowing the impact of including environmental criteria																		
Starting a plan to sell consultancy services	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
Taking part in Agenda 21 projects	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
Investing in appropriate environmental training	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
Reporting the company's environmental efforts	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
Expanding the information users are given about the product's environmental behaviour	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
Knowing the customer's expectations about the product's environmental behaviour	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5
Introducing green purchasing criteria in material acquisitions	0	1	2	3	4	5	0	1	2	3	4	5	0	1	2	3	4	5

Note how some of the proposed actions are clearly linked to improving productivity and, despite being beneficial to the environment, they are also a source of savings or financial benefits. The two areas, financial and social, do not always conflict with one another.

The proposed list may be adapted to company's specific situation or business centre. It is worth adapting it to your specific case and your company's particular features. You could include new sections such as:

- Land occupancy (warehouses and facilities).
- Transport and internal carriage of parts.
- The process' sensory impacts (smells, heat, etc.).

In any case, thinking about these issues makes it clearer where you need to start. In view of limitations on management ability and the internal impacts (on the profit and loss account), assessing the expectations the company's action creates is a good indicator of priorities.

We think that a priori identification and assessment is the first, major step in introducing externalities in the company's environmental behaviour and calculations along the lines set out in the Earth Summit.

17. Enhance corporate environmental and social responsibility and accountability. This would include actions at all levels to:

- a) Encourage industry to improve social and environmental performance through voluntary initiatives, including environmental management systems, codes of conduct, certification and public reporting on environmental and social issues.

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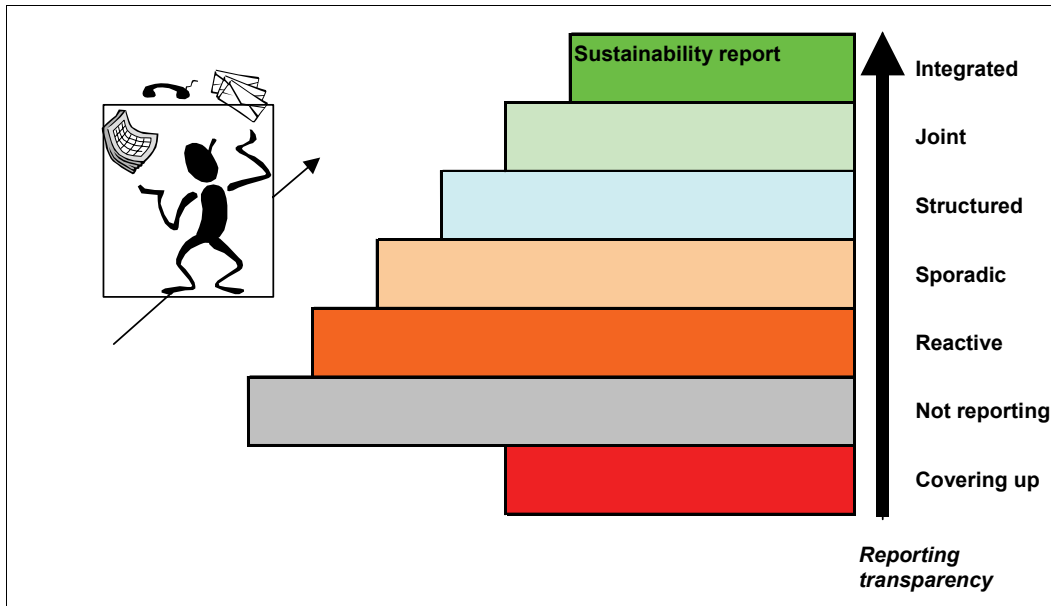
18.b) Continue to promote the internalization of environmental costs and the use of economic instruments.

More than one response to the above list is possible. It is useful to give different responses over time, so that you can see how perceptions change, as a way of identifying the degree of the company's progress or change in its expectations. There is no difficulty in measuring a collective response (by all the members of the board of directors, for instance). The average of the viewpoints may be an appropriate measurement of the whole group's opinions.

After these specific observations you need to move on to pinpointing actions and then review the situation for comparative purposes; this kicks off a review mechanism of the kind used in quality circles aimed at ongoing improvement of environmental management and, by extension, sustainable development.

It is up to company policy to decide the level at which it is worth explaining the changes in the sustainability report, alongside the indicators mentioned in chapter 4.

Note different levels of reporting that are involved in the dynamics of publishing sustainability data, which can be interpreted as different degrees or stages of publication, as suggested by the figure below.



Source: own data

One may go from a position in which environmental information is hidden in order to avoid undesired affects that could arise from them becoming known to a position of simply “not reporting”. The next step is completely reactive: reporting when a conflict takes place (reacting to events that the company does not control). Next comes sporadic reporting without keeping a structure in place to enable comparison to reach a better level in which environmental reporting is structured in order to enable comparison and publication of the data with a known frequency (environmental reports). The last two steps in the reporting transparency scale concern a situation in which environmental information (environmental reports) have the same importance, frequency and publication as financial reports. The last stage involves the integration of three reports - financial/accounting, environmental and social - in a single publication or sustainability report (see the GRI approach in chapter 3).

It is a positive thing to take action and do it well, but it is better to know how and let others know how to do it well. That could be the motto behind a communication policy. In any case, the company’s communication policy is an exercise in transparency that the company carries out that is very much bound up with the fourth aspect of sustainable development: ethical behaviour.

Let us now return to the company’s response dealt with in chapter 1 in relation to a proactive attitude in tackling the new challenge for companies in the 21st century: being sustainable.

The reader’s patience in reviewing the changing setting and knowledge management, leading to consideration of environmental parameters in the company’s entire decision-making process, and the company’s reactive and proactive responses (chapter 1) has made it possible to study the difficulties, costs and gains that may arise, and shows the appropriateness of making the company’s business more environmentally-friendly and the instruments it needs (chapter 2).

We then focussed on the modifications that need to be made to include environmental data in project assessment criteria in order to typify the composition of projects underway in a company (chapter 3). This makes it possible to record environmental factors in accounting terms, include them in the annual accounts and draw up a specially designed model to show the progress and environmental result arising from carrying out projects. All this was done in chapter 4. In this last section we have dealt with the connectivity of agenda 21 projects as a more relevant and specific aspect of sustainable development.

Let us round off by suggesting you look over the different viewpoints by filling in the questionnaire in annex 1.

We have gone through the implications of environmental aspects, as part of sustainability, in order to arrive at the ethical values that make it possible for the company to tackle the challenge of making it profitable to be sustainable, as a core objective of the kind of company we want in the 21st century.

Now it is up to you decide, and for us to recognise the efforts you make, for which we are truly grateful.

6. CASE STUDY: APPLYING THE MANUAL IN THE COMPANY FUMFU, S.A.

Mr. Manú is the managing director and majority shareholder of the company FUMFU, S.A., which manufactures multipurpose plastic caps. He attended a company/city sustainability seminar sponsored by GENEOPC aimed at high-level executives of SMEs.

At one point in the seminar, the session coordinator asked Mr. Manú to present the company he managed to the rest of those attending, emphasising the environmental impacts of the process, which Mr. Manú did very accurately.

The seminar presenter noted down the most relevant aspects of Mr. Manú's description.

The presenter's notes were as follows:

"Company: FUMFU, S.A.

Industrial sector: Chemical

Environmental considerations:

FUMFU, S.A. manufactures and markets multipurpose plastic caps.

FUMFU, S.A.'s facilities are in an industrial estate next to the town of Vilanet. FUMFU's production does not release hazardous emissions into the atmosphere and there have been no disputes with the local population.

FUMFU, S.A.'s production process consists of introducing chemical reagents and polymers according to the exact formulation required by the product to be manufactured, using the relevant moulds and then carrying out a reaction for the necessary length of time. The product is then cooled and packaged in the usage containers.

Size: FUMFU, S.A. has a staff made up of the managing director (Mr. Manú), the plant manager, the salesperson and two secretaries, plus ten plant operators (staff costs: €250,000/year).

Market share:

The company is a comfortable third in the market, with a 17% share and pretty loyal customers".

Those attending the seminar were invited to answer a very simple questionnaire consisting of four questions:

NO, I completely disagree	YES, I completely agree
------------------------------	----------------------------

Are you completely sure that considering the environmental impact would not lower current costs?	0	1	2	3
--	---	---	---	---

Are you sure that considering the environmental impact would not involve a reduction in the risks that the current activity poses for long-term financial survival?	0	1	2	3
---	---	---	---	---

Are you sure that considering the environmental impact would not involve a reduction in the management team's current liabilities?	0	1	2	3
--	---	---	---	---

Are you sure that considering the environmental impact would not provide a new source of business opportunities?	0	1	2	3
--	---	---	---	---

Mr. Manú gave scores of 1, 1, 1 and 0, respectively. Mr. Manú mentioned that the rest of those attending the seminar had given similar opinions, and the presenter of the seminar concluded the following:

"If you are unsure, if you are in doubt, you can invest part of your time in finding evidence for the negative response or, if you already have it, obtain new knowledge enabling you to develop new business opportunities (profit)."

After the working lunch, during the exchange of opinions that was part of the event, he compared opinions and views with several of those attending the seminar who ran customer companies that, just like FUMFU, S.A., have a complex production system, and Mr. Manú went away with two statements in his notebook concerning "ideas to develop":

"The waste the industry "produces" comes from ingredients that have been purchased; the "leftovers" of materials disposed of as waste, which have been purchased and have cost certain amounts of money: are these amounts significant?"

Mr. Manú made a note to ask his accountant what the cost of the waste would be. He was under the impression that all of the useful information about the production process was not in his balanced scorecard. So he wrote the following in his notebook:

"Do research!"

The second idea he noted down concerned a question that was asked during the talk. Why not start now?

“Interesting”

This is the note that Mr. Manú read out to his assistant the following morning, when he decided to talk to his closest colleagues about the ideas from the seminar.

During the evening after the seminar, Mr. Manú decided to get his colleagues to fill in the questionnaire and added an extra question:

Is it worth introducing management criteria aimed at sustainability **now**?

His colleagues said:

“It is always a good idea, but the bulk of the market would not appreciate it enough and we would lose time and money”.

“We are not market leaders and CDFC, which is, has not raised the issue. It would be best to forget about it”.

“I do not know how much it would affect our marketing plan. What aspects would be affected?”

Mr. Manú used the “IS IT WORTHWHILE?” questionnaire.

“IS IT WORTHWHILE?” questionnaire

	Degree to which it affects the company					
	Low			High		
1. The company is aware of the environmental regulations that apply to its processes and products	0	1	2	3	4	5
2. The company complies with all of the environmental regulations that apply to its processes and products.	0	1	2	3	4	5
3. The company receives complaints about the environmental effect of the production process or the use of its products.	0	1	2	3	4	5
4. The company’s business depends on contracts with public authorities.	0	1	2	3	4	5
5. The company’s products have severe environmental effects.	0	1	2	3	4	5
6. Accidents have taken place in the company’s business that have significant environmental implications.	0	1	2	3	4	5
7. Legal provisions limit the technical possibilities of its business.	0	1	2	3	4	5
8. The business produces considerable amounts of waste.	0	1	2	3	4	5
9. The business uses and produces hazardous waste.	0	1	2	3	4	5
10. The production process has severe environmental effects.	0	1	2	3	4	5
11. The production process significantly depends on natural resources.	0	1	2	3	4	5
12. The company can guarantee that its waste is reused as much as possible.	0	1	2	3	4	5
13. There is a quality improvement programme for the production process.	0	1	2	3	4	5
14. There is sufficient cover to redress the damage in the event of environmental accidents.	0	1	2	3	4	5
15. A significant proportion of the companies it sells to have environmental certification.	0	1	2	3	4	5

Mr. Manú had anticipated the kind of responses that would be given and worked out the average figures for each issue in order to have as objective as possible an overview.

They agreed that in the next management team meeting (meeting number 2) they would produce an overview of the production process, stressing the environmental impact of the company’s business.

The accountant and the new customer sales manager attended the second meeting. They looked at the situations of companies with similar processes and FUMFU, S.A.'s competitors. Here are some of the comments from the second meeting:

“Our competitor ACME does not use water in its system. Water is only used to clean floors to wash away the small spills of raw materials and transfers between liquid storage tanks”.

“The last risk audit found no significant safety failures, but led to a 10% rise in the insurance premium the company pays for operators in contact with toxic products. The premium went up from €91 to €100/year/person”.

“A new product has recently come onto the market, which is in competition with those that FUMFU, S.A. produces. The product has a similar price and quality, but its marketing stresses the "TOXIC FREE" labelling. This product has achieved 8% market share in just five months. Although FUMFU, S.A.'s sales have not fallen, they have remained stable over the period”.

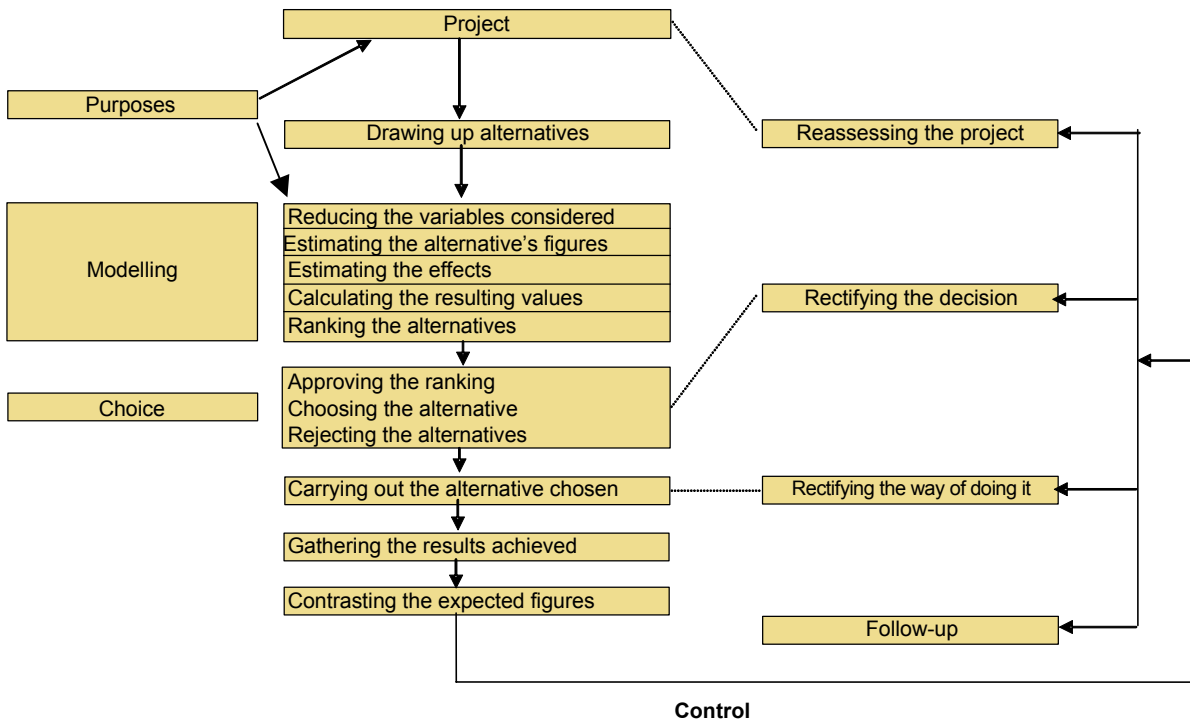
In view of these features of the context in which the business was being carried out, Mr. Manú looked into an alternative to the problem detected in the packaging:

Raw materials were received in 200-litre metal cans, as packaged by the supplier. These metal cans were placed on shelves adapted for that purpose in the industrial premises. The cans then needed to be moved to the mixing machine. The mixing in the reactors and the raw material scales were also carried out by hand.

This situation involved a set of costs that could be reduced through can-free storage and dispensing, which would free up the storage space taken up by this waste. The high production of empty cans grew in proportion to the growth in the company's sales. The same applied to storage, transfer and final management costs.

These considerations led Mr. Manú to decide to invest in replacing the process and carry out new investments.

During the development of the waste minimisation plan (cans in this case) and loss of materials during container transfer, the steps set out in chapter three were followed. These are set out in the figure below.



The project involved fitting a dispensing and storage system. It consisted of fitting the raw material receipt system, building five specific tanks measuring 25 m³ each and an automatic dosage system.

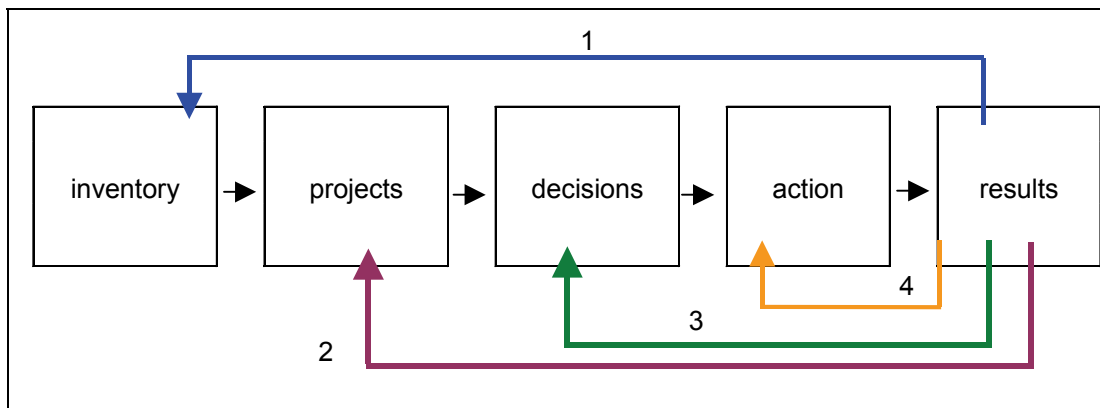
The tanks are located outside the industrial premises, which allows the tankers to fill them directly without intermediate transfers being required.

This system was expected to reduce the number of cans, cut the amount of waste due to loss of the stored materials and improve working conditions (lower hazard index).

The investment was €12,000 and involved savings quantified as follows:

- a) Reducing the purchasing management costs by 20% compared to the total. This improvement came from purchasing larger amounts in each order compared to the previous system. It is estimated at a figure of €4000/year.
- b) These modifications also made it possible to improve the use of raw materials. This is estimated at a reduction of 10%, i.e. €4500/year.

A reduction of 35% in the number of cans used (saving on storage and handling, cleaning and knowledge costs) was finally achieved. This is estimated at €3800/year.



Mr. Manú and his accountants went over the assessment criteria (described in chapter 3) and did the following calculation:

According to the recouping term criteria (see chapter 3), the expected investment would be recouped in:

$$18,000 / (4,000 + 4,500 + 3,800) = 1.5 \text{ years}$$

They considered the investment recouping term to be very low and to allow economics profits to be increased in less than two years.

They decided to follow this alternative.

By then they had carried out the option inventory and project inventory stages (options involving technical doubts and difficulties had been filtered), and they had decided to carry out one of the alternatives considered and take action. The alternative was carried out. In order to do this, Mr. Manú used indicators to help develop and monitor the activity and the effectiveness of the measures adopted.

The following management indicators were established:

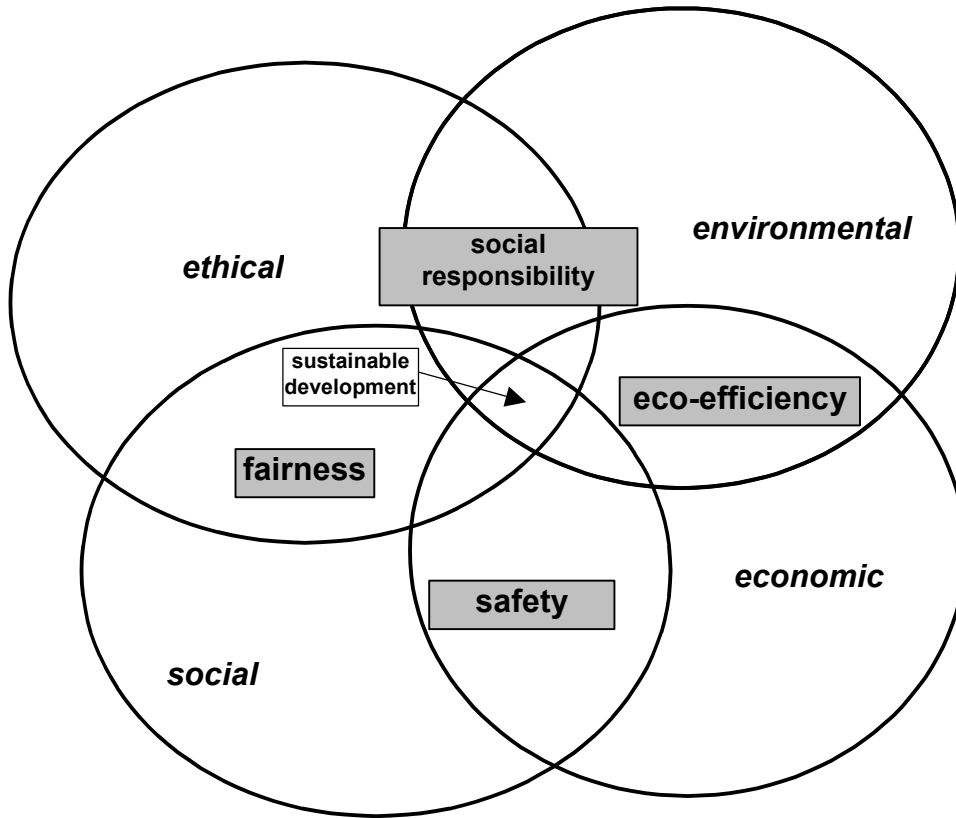
Number of cans handled by the company.

Change in the unit cost of materials per unit of product.

The results obtained at the end of the first six months after the facilities were fitted were better than expected.

Figure considered	Estimated value	Value achieved
Lower purchasing management cost	-20% €4,000/year	-18% €3,200/year
Better use of materials	€4,500/year	€4,900/year
Reduction in the number of cans	35% €3,800/year	55% €4,400/year

The stage in which the success of the action is assessed, in this example a success situation, is in part motivated by the problem's location: reduction of waste in the set of eco-efficiency problems.



In this area of eco-efficiency, improvements in environmental aspects mean improvements in the economic area.

Not all situations will be so clear, but ethical training and promoting it in the development of sustainability will always provide economic reasons.

The result of the action carried out is considered positive and the various costs that it involved and involves for society can be analysed (based on the list in chapter 5).

Environmental results	
Costs	Income
<p><u>Direct management costs</u></p> <ul style="list-style-type: none"> • Facility maintenance (specific). • Waste collection, transport and treatment. • Transport and disposal of rejected products and waste. • Environmental damage insurance. • Training costs. • Information access costs. • Specific taxes, charges and rates. 	<p><u>Direct management income</u></p> <ul style="list-style-type: none"> • Access to new markets in which the product's environmental behaviour is appreciated (green purchasing). • Sale of recovered waste. • Aid and subsidies for environmental action. • Reduction in insurance cost. • Sale of technology or information about the environmental process. • Advice on environmental matters. • Better potential product quality (higher added value).
<p><u>Costs of future responsibilities</u></p> <ul style="list-style-type: none"> • Cleaning up polluted areas • Contributing to cleaning up infrastructure. • Redress and compensation for damages. Health and ecosystems. • Legal costs. 	<p><u>Income from future responsibilities</u></p> <ul style="list-style-type: none"> • Higher value in cases of sale, winding up and merger due to having no environmental liabilities. • Access to financial markets under better conditions (lower risk, lower cost). • Lower provisions for redress and compensation for damage.
<p><u>Hidden management costs</u></p> <ul style="list-style-type: none"> • More production costs to reduce polluting effects. • Cost of measures to adapt to and comply with regulations. • Bureaucratic management procedures (mainly rejected products and waste). • Cost of obtaining permits. 	<p><u>Hidden management income</u></p> <ul style="list-style-type: none"> • Saving on consumption per unit (reduction in use of materials in the product and process). • Fewer expenses from management of rejected products and waste. • Fewer management hours. • Fewer provisions for infringements.
<p><u>Intangible costs</u></p> <ul style="list-style-type: none"> • The company's risk concerning environmental liabilities. • Complicating relations between workers and trade unions. • Negative publicity. • Social opposition to the facilities. • Being left behind direct competitors. • Cost of not acting. 	<p><u>Intangible income</u></p> <ul style="list-style-type: none"> • More motivated staff (lower risk, more comfort, more environmentally responsible). • "Clean" corporate image. • Absence of environmental disputes. • Greater company credibility. • Society views the company and the owners positively. • Greater ability due to knowledge (see chapter 2). • A good position that makes you a cut above the competition.

In this context, Mr. Manú stressed the aspects he deemed priorities. His assessment of the aspects led him to consider two options:

- a) Progressive mechanisation of the dosage process to further reduce waste.
- b) Transferring this form of organisation to different companies in the industry and the companies that operate as franchises. This would be a new source of action and income.

Furthermore, Mr. Manú is valued and well-known in the town. In order to strengthen his profile in the activities carried out in the town, he proposed taking part in a new side of the town's Agenda 21 project to dispose of the waste still being produced.

Taking part in the Agenda 21 project and boosting knowledge growth in three companies in the industry are two of the aspects mentioned in chapter 5.

FUMFU, S.A.'s work never ends. The path towards sustainability is long and tough, but the possibility of finding support and satisfaction from seeing aspects of sustainability being achieved without losses or with bearable costs is undoubtedly cause for satisfaction for all of the company's partners and all those involved in its business.

7. ANNEX 1: QUESTIONNAIRE

Approximate length: 15 minutes.

The purpose of this exercise is to assess your change of perspective since reading this publication. After you have read it, answer the questions below on a scale of nought to three. “Nought” means you disagree and “three” means you completely agree with the proposed statements.

	NO, I completely disagree	YES, I completely agree		
You need to carry out an immediate review from the point of view of sustainability.	0	1	2	3
It is essential to carry out environmental management in the same way as all other variables are managed.	0	1	2	3
The benefits exceed the costs and difficulties of carrying out sustainable management.	0	1	2	3
Considering the environmental impact would reduce risk and enable the company's survival.	0	1	2	3
Would considering the environmental impact reduce the management team's liabilities?	0	1	2	3
Would considering the environmental impact create a source of new business opportunities.	0	1	2	3
The company has effectively performed environmental management, which is one of its competitive advantages.	0	1	2	3

After you have answered them, transfer the responses to the questionnaire in chapter 2 into column 3 in the same order.

Work out the difference between the values in the “difference” column and note the value.

	Annex value	Chapter value	Difference
Question 1			
Question 2			
Question 3			
Question 4			
Question 5			
Question 6			

If all of the differences are **nought**, that means that reading this publication has not changed the point of view you had when you filled in the first questionnaire. We hope that it is confirmed by new arguments or applicable instruments.

If the differences amount to **three**, that means there has been a radical change in your viewpoint of the matter. **There is no doubt that it is the start of the path towards sustainability.**

8. ANNEX 2: ICAC REGULATIONS

Decision of 25 March 2002 by the Institute of Accounts and Accounts Auditing, approving the rules for recognition, valuation and reporting of environmental aspects in annual accounts (Official Spanish Gazette of 4 April 2002).

Final provision five of Royal Decree 1643/1990 of 20 December, approving the General Accounts Chart, stipulates that the Institute of Accounts and Accounts Auditing may issue a Decision laying down compulsory regulations to develop the valuation rules in the General Accounts Chart.

The purpose of this Decision is to develop aspects concerning environmental accounting incorporated into Spanish accounting law through Royal Decree 437/1998 of 20 March, approving the Rules to Adapt the General Accounts Chart to companies in the electricity sector, which modified the Plan in the sense of making it compulsory to include in companies' annual accounts any significant information concerning the prevention, reduction and repair of the environmental impact arising from their business.

Due to the financial repercussions that this situation has for companies, there is no doubt that, as a discipline that seeks to communicate economic information, through the annual accounts, to third parties other than the accounting entity, accountancy must report on environmental contingencies and obligations that affect or may affect its financial position in the future. There is growing demand for such information from many different kinds of users: the financial industry, mainly insurance and loan companies, public authorities, investors, clients, suppliers and employees, etc.

One of the precedents that was taken into consideration in introducing the foregoing information into Spanish accounting law was the document by the European Union's Contact Committee on the Accounting Directives, "Commission interpretative communication concerning certain articles of the Fourth and Seventh Directives on accounting", published in the Official Gazette of this Institute (BOICAC no. 33), and the work carried out regarding this subject matter by other international bodies (IASB, ISAR, etc.).

A European Union Recommendation has now been approved (published in BOICAC no. 46), which sets out the accounting rules that the European Commission considers that Member States must comply with, if they so deem appropriate (since it is a recommendation), in order to incorporate this information into the annual accounts and the management report. This text has been used as a reference for drawing up this Decision.

The first rule lays down the obligation to report environmental matters. It affects individual and consolidated annual accounts. Therefore, it also applies to non-profit organisations.

The second rule, "Environmental responsibilities" includes a definition of the source of environmental obligations that lead to these kinds of responsibilities arising.

An important matter dealt with in the third rule is the definition of the concept of the environment. This concept is restricted to the natural environment, according to the European Union Recommendation, so although the definition could be expanded, it seems reasonable to use it as we have to the particular features of the matter. The possibility of expanding it is a process that could be undertaken in the future as the need arises. So, specifically regarding the concept of environmental expenses, they include, among others, waste management, protection of land and surface and underground water, protection of the open air and climate, noise reduction and protection of biodiversity and landscape.

Following this definition of the concept of the environment comes rule four, “Environmental Expenses”, five, “Environmental Assets”, six, “Environmental Provisions and Contingencies” and eight, “Long-term obligations to repair the environment”, which explains how although specific accounting rules are not required for the way in which the various operations arising from the protection or repair of the environment are treated, the necessary nuances must be added to the general rules to cover these special features.

One specific matter was the treatment of “compensation receivable from a third party” as a result of environmental obligations, which are regulated in rule seven. So, bearing in mind that it is a criterion that has a general scope for compensation payable by a third party in relation to other obligations, it has been included in this Decision due to being part of the European Recommendation. This, in turn, must be assessed within the framework of the process of bringing European accounting regulations in line with the rules issued by the IASB (*International Accounting Standards Board*).

In particular, the criterion incorporated in this rule states that if there is no legal or contractual link whereby that third party accepts the liability arising from the obligation, it cannot be compensated for with the amount to be collected as a debt; this implies that the compensation to be obtained will be recorded by incorporating the relevant asset when the event or action requiring compensation to be paid takes place, up to the limit of the amount envisaged. In any case, this Decision develops this specific aspect of the criterion introduced into Spanish accounting law through valuation rule 23.^a, “Compensation from insurance companies”, included in part five of the rules adapting the General Accounts Chart to companies in the wine industry, approved by Ministry of the Economy Order of 11 May 2001, since although it is an industry-specific regulation, it enables the appropriate accounting system to be used for the operation as a whole.

Rule nine, “Information to be provided in the report”, incorporates the minimum information that must be included, whenever it is significant, in the report on the annual accounts.

Lastly, rule ten describes the accounts that can voluntarily be used in order to aid the recording of the transactions covered by this Decision.

In accordance with the foregoing, bearing in mind the need to specify and develop the information that the annual accounts should contain regarding the matter, and in order to provide a rule that contains the criteria this institute has set out in various replies to queries received, by virtue of article 2 of Act 19/1988, of 12 July, on Auditing final provision five of Royal Decree 1643/1990, of 20 December, approving the General Accounts Chart, and section 3 of final provision one of Royal Decree 776/1998 of 30 April, approving the rules for adapting the General Accounts Chart to non-profit organisations and the budget reporting rules of such organisations, this Institute of Accounts and Accounts Auditing hereby issues the following Decision:

One. Application.

This Decision generally applies to the recognition, valuation and reporting of environmental matters that is necessary in order for individual and, when applicable, consolidated annual accounts to show a true and fair view of the net equity, financial situation and results of the body the accounts concern.

Two. Environmental Responsibilities.

1. For the purposes of information to be included in annual accounts, environmental responsibilities are considered to be current obligations that will be fulfilled in the future, which arise from the actions of the body the accounts concern in order to prevent, reduce or repair damage to the environment.
2. The obligations mentioned are determined by:
 - A legal or contractual provision.
 - An implicit or tacit obligation, which arises from the expectation the company has given third parties based on its attitude towards protecting the environment, which the company cannot

avoid. Such an expectation is deemed to have been created when the company has accepted an environmental responsibility in a public statement or it has traditionally accepted such responsibility.

- The probable changes in environmental regulation, in particular, government bills and proposals, which the company cannot avoid.

Three. Definition.

For the purposes of this Decision, environmental activity means any operation the main purpose of which is to prevent, reduce or repair damage to the environment.

The term environment means the natural physical surroundings and includes air, water, land, flora, fauna and non-renewable resources such as fossil fuels and minerals.

Four. Environmental Expenses.

1. Environmental expenses are the amounts accrued from environmental activities that have been or are to be performed in order to manage the environmental effects of the company's operations, as well as those arising from the environmental commitments of the accounting entity. These include the expenses arising from preventing pollution related to its current operating activities, treatment of waste and dumping, decontamination, restoration, and environmental management of environmental auditing.
2. The environmental expenses arising from these activities are considered operating expenses in the financial year in which they accrued and are included in the profit and loss account in the relevant entry. When the amount is significant, a specific entry shall be created called "Environmental Expenses" within the group of "Other operating expenses" in the Debit section of the profit and loss account forms incorporated in the fourth part of the General Accounts Chart, approved by Royal Decree 1643/1990 of 20 December.
3. If expenses are incurred in a particular operation that could be environmental in nature in part, the amount should be separately acknowledged whenever it is significant.
4. Extraordinary expenses are those that arise as a consequence of events that have taken place outside of the company's ordinary business and are not expected to take place frequently. Extraordinary expenses include fines, penalties and compensation payable to third parties due to harm caused by environmental damage. On the other hand, those that arise from environmental actions that must be carried out now or in the future, as a result of events that took place in the past, are not considered extraordinary expenses, except in cases in which there is a change of criterion or correction of an accounting error in prior financial years.

Five. Environmental assets.

1. Items included in the organisation's net equity in order to be used in its business on a long-lasting basis, the main purpose of which is to minimise the environmental impact and protect and improve the environment, including reducing or eliminating future pollution from the organisation's operations, shall be recorded in the relevant entries in group B) "Fixed assets" in the assets on the balance sheets in the forms included in the fourth part of the General Accounts Chart.
2. For these purposes, the recording of assets, the calculation of the acquisition price or production cost and the amortisation criteria and valuation adjustments to be carried out shall be recorded taking into account the valuation rules set out in the General Accounts Chart and, in particular, according to that stipulated in Valuation Rule 3.^a, "Specific rules concerning tangible fixed assets", letter f), and its development in rule three, "Increases and improvements to tangible fixed assets" in Institute of Accounts and Accounts Auditing Decision of 30 July 1991, laying down valuation rules for tangible fixed assets and the Decision of 9 May 2000 on determining the production cost.

3. In any case, for the purposes of valuation adjustments to be made to certain assets, one should take into account the environmental factors that could affect them.

Six. Environmental provisions and contingencies.

1. An environmental provision shall be recorded for expenses arising in the same financial year or in a previous one, which are clearly environmental in nature, but which, at the end of the financial year are probable or certain but the exact amount of which or the date on which they will take place is undetermined.
2. Depending on the information available, the amount of this provision shall be the highest possible estimate of the expense required to meet the obligation on the balance sheet's closing date. This estimate shall be made taking the following circumstances into account:
 - Its quantification shall be unaffected, in principle, by the amount that is expected to be obtained from the sale of the organisation's asset items directly related to the origin of the obligation.
 - The aforementioned estimate should be reviewed in later financial years in accordance with the new information available.
 - Furthermore, when it is significant, the relevant financial effect on the calculation of the provision should be taken into consideration.
 - The uncertainty involved in determining this amount does not justify not recognising it. When it is not possible to produce a better estimate, the possible amounts of expected future expenses should be assessed and a provision made for at least the minimum amount assessed. This information should be rounded off in the aforementioned report with, among other questions, the exceptional reasons for this situation.
3. These provisions are shown in group C), "Provisions for risks and expenses", in particular in entry 3, "Other provisions", in the liabilities on the balance sheet in the normal form in part four of the General Accounts Chart. If the amount of this provision is significant, a specific entry should be created in the stated group of the liabilities, with the following name: "Provision for environmental actions".
4. The obligation shall be contingent and therefore the shall be reported in the report on the annual accounts in the following cases:
 - When fulfilling the obligation is not likely to result in an outgoing of resources.
 - When the obligation is conditional upon an uncertain or unlikely event occurring, which the organisation cannot influence and which confirms the source of the obligation.

Seven. Compensation receivable from a third party.

1. Compensation receivable from a third party at the time the obligation is fulfilled must not be recorded as a smaller debt and, when applicable, shall be recognised in the assets of the organisation entitled to collect it, provided there is no doubt that such reimbursement will be received. The amount at which this asset is recorded may not exceed the amount of the obligation recorded in the accounts.
2. Only when there is a legal or contractual link through which the environmental risk has been outsourced, whereby the organisation will not be held liable, it shall be taken into account in estimating the amount at which any provisions will be recorded.

Eight. Long-term obligations to repair the environment.

1. The expenses for activities to decontaminate and restore polluted places, dispose of accumulated waste and close or dispose of fixed assets shall require the relevant provision to be made up until the company needs to fulfil this obligation.
2. When the use of fixed assets causes damage to the environment that is to be repaired at the end of its useful life, the organisation must make a systematic provision in each of the financial years in which it is used for the proportionate part of the estimated amount needed to repair the damage caused.
3. In order to record and value the events described in the previous sections shall apply to the rules in this Decision.

Nine. Information to be provided in the report.

All significant information concerning the items described in the foregoing rules must be provided in the report on the annual accounts, in particular the following:

1. Section 4. "**Valuation**" shall contain:
 - Valuation criteria, as well as the allotment of the amounts used for the foregoing purposes to profits/losses. In particular, the criteria used to consider these amounts expenses in the financial year or as a higher value of the relevant asset shall be stated.
 - Description of the method used to estimate and calculate the provisions arising from the environmental impact.
 - Accounting policies concerning decontamination and restoration of polluted places.
2. Section 15. "**Tax situation**" shall include information about deductions due to investing in measures to reduce the environmental impact.
3. A new section 22. "**Environment information**" shall be created in which the following information must be succinctly provided:
 - a) Description and features of the most significant systems, equipment and facilities included in the tangible fixed assets and the protection and improvement of the environment, stating their nature, purpose, book value and their relevant accumulated amortisation whenever it can be individually calculated.
 - b) Expenses incurred during the financial year, the purpose of which is the protection and improvement of the environment, differentiating between ordinary and extraordinary expenses, stating their purpose in each case.
 - c) Risks and expenses for the provisions for environmental actions, in particular stating those arising from the legal action in progress, compensation and others; the following shall be stated for each provision:
 - Initial balance.
 - Provisions.
 - Applications.
 - Final balance.
 - d) Contingencies related to protecting and improving the environment, including the risks transferred to other organisations, the system for assessing the estimate and the factors on which it depends, stating the possible effects on the net equity and the profits/losses; when applicable, state the reasons preventing such an assessment, as well as the maximum and

minimum risks; the operating and financial effects foreseen as a result of the commitments and future environmental investments.

- e) The full amount of the environmental liabilities and, when applicable, the compensation receivable.
- f) The environmental subsidies received, as well as the income produced as a result of certain activities related to the environment.

Ten. Accounts to be used to record environmental effects.

While their numbering and names are not compulsory, the following accounts are proposed:

In subgroup 62:

"622. Repairs and conservation.

Those arising from holding the goods in group 2, as well as the expenses of reduction or repairs for the damage caused to the environment. The latter case includes those arising from the Integrated Waste Management Systems (Act 11/1997 of 24 April and Act 10/1998 of 21 April)." Its development in terms of four digits is as follows:

6220. General repairs and conservation

6223. Environmental repairs and conservation

"623. Independent professional services.

The amount paid to professionals for services rendered to the company. This includes the fees of economists, lawyers and auditors, including environmental ones, notaries public, etc., as well as the commission of independent intermediaries." Its development in terms of four digits is as follows:

6230. Independent professional services

6233. Environmental services

Charges to accounts 622 and 623 are normally paid into account 410, and those to subgroup 57 accounts into subgroup 14 provisions or, when applicable, account 475.

Subgroup 14:

"145. Provision for environmental actions.

Those created as a result of the company's legal or contractual obligations it has acquired in order to prevent, reduce or repair damage to the environment."

The activity is as follows:

- a) It is paid when the obligation or commitment arises, and is generally charged to account 622 or 623.

b) It will be charged:

b1) When the provision is applied, and generally paid into the subgroup 57 accounts.

b2) When there is an excess provision, it is paid into account 790.”

Final provision. Entry into force.

This Decision shall come into force on the day after it is published in the Official Spanish Gazette.

9. ANNEX 3: COMMUNICATION CONCERNING THE FOURTH AND SEVENTH DIRECTIVES ON COMPANY ACCOUNTING

1. INTRODUCTION

1. The fourth and seventh Council Directives are the main harmonization instruments in the accounting field within the European Union¹.
2. In the present interpretative communication, the Commission comments on topics where authoritative clarification appears to be required. The topics have been chosen taking into account discussions in the Contact Committee on the Accounting Directives as well as discussions at the Accounting Advisory Forum.

The views expressed in this Communication do not necessarily represent the views of the Member States and should not, in themselves, impose any obligation on them. They do not prejudge the interpretation that the Court of Justice, as the final instance responsible for interpreting the Treaty and secondary legislation, might place on the matters at issue.

3. The Contact Committee was set up pursuant to Article 52 of the fourth Directive and it consists of representatives of the Member States and the Commission. An important function of the Contact Committee is to facilitate a harmonized application of the Accounting Directives through regular meetings, dealing in particular with practical problems arising in connection with their application. The adoption in 1995 of a new approach to accounting² gave a fresh impetus to this aspect of the Contact Committee's work. In particular, the comparison between international accounting standards (IAS) and the Accounting Directives made for the Contact Committee by its special Task Force³, and the continuing work on avoiding divergence between IAS and the Directives carried out in the Committee's Technical Sub-committee, has allowed the Contact Committee to resolve a number of long-standing differences on questions relating to the application of the Directives. The Accounting Advisory Forum is a consultative body which the Commission set up in 1990. It is composed of representatives of the accounting standard setting bodies in Member States and of European organizations which represent the main users and preparers of accounts.

On environmental accounting, the Commission intends to issue further guidance through a recommendation.

¹ Fourth Council Directive 78/660/EEC of 25 July 1978 on the annual accounts of certain types of companies (OJ L 222, 14.8.1978, pp. 11 to 31). Seventh Council Directive 83/349/EEC of 13 June 1983 on consolidated accounts (OJ L 193, 18.7.1983, pp. 1 to 17). In the banking and insurance sectors respectively also the following Directives apply: Council Directive 86/635/EEC of 8 December 1986 on the annual accounts and consolidated accounts of banks and other financial institutions (OJ L 372, 31.12.1986, pp. 1 to 17). Council Directive 91/674/EEC of 19 December 1991 on the annual accounts and consolidated accounts of insurance undertakings (OJ L 374, 31.12.1991, pp. 7 to 31).

² 'Accounting harmonization: A new strategy vis-à-vis international harmonization', communication from the Commission, COM(95) 508, November 1995, p. 8.

³ 'An examination of the conformity between the international accounting standards and the European Accounting Directives', European Commission, 1996, p.22.

2. THE FOURTH COUNCIL DIRECTIVE ON THE ANNUAL ACCOUNTS OF CERTAIN TYPES OF COMPANIES ⁽⁴⁾

2.1. General provisions

2.1.1. True and fair view (Article 2 (3) to (5))

4. According to Article 2 (3) of the Directive, the annual accounts shall give a true and fair view of the company's assets, liabilities, financial position and profit or loss. In addition, Article 2 (4) requires that additional information must be given where the application of the provisions in the Directive is not sufficient to give a true and fair view. Article 2 (5) requires that a specific provision of the Directive must be departed from where, in exceptional cases, application of that provision would be incompatible with the obligation to give a true and fair view. Any such departure must be disclosed in the notes to the accounts together with an explanation of the reasons for it and a statement of its effect on the assets, liabilities, financial position and profit or loss.
5. The true and fair view principle must be applied by the companies themselves. Only where additional information is not sufficient to give a true and fair view can any provision of the Directive be departed from. Such a situation will only occur in exceptional cases.
6. As stated in the last sentence of Article 2 (5), Member States may define the exceptional cases in question and lay down the relevant special rules. In the interest of harmonization, Member States may however not use the last sentence of Article 2 (5) in order to introduce an accounting rule of a general nature which is contrary to provisions of the Directive, nor can they use this sentence to create additional options allowing for accounting treatments which are not in conformity with the Directive.

2.2. General provisions concerning the layouts

2.2.1. Prohibition of setting-off (article 7)

7. Article 7 of the Directive prohibits any set-off between asset and liability items, or between income and expenditure items.
8. The setting-off cases referred to in Article 7 should not be confused with the cases where a legal right exists to set off claims and debts by virtue of the law or of a contractual arrangement. An immediate consequence of the legal right to set off is that only the remaining amount can and must be shown in the accounts.
9. There exist, however, complex transactions where the income and expenditure involved is, from an economic viewpoint, without importance as regards the final outcome of the transaction. In some cases the true and fair principle would require that only the final result of a complex operation be shown, although every case must be judged on its own merits.

2.3. Balance sheet

2.3.1. Capitalization of certain intangible fixed assets (Articles 9 and 10)

10. In accordance with the layout of the balance sheet, the heading 'Intangible assets` includes concessions, patents, licences, trade marks and similar rights and assets if they were acquired

⁴ When the term 'the Directive` is used in this part it refers to the fourth Directive, unless other references are clearly made.

for valuable consideration or if they were created by the company itself and capitalization is permitted under national law.

11. It follows from the wording of the Directive that these assets, when acquired for valuable consideration, must be capitalized. Only in the case of rights and assets created by the company itself does the Directive permit Member States to decide whether or not they should be capitalized.
- 2.3.2. Balance sheet items concerning undertakings with which a company is linked by virtue of participating interests (Articles 9, 10 and 11)
12. The balance sheet layouts require that claims on and amounts owed to undertakings with which a company is linked by virtue of participating interests are shown separately. A participating interest is defined in Article 17 as meaning rights in the capital of other undertakings, whether or not represented by certificates, which, by creating a durable link with those undertakings, are intended to contribute to the company's activities.
 13. The question arises whether claims on and amounts owed to such undertakings should be shown separately only by the company which held the participating interest or also by the company in which the participating interest is held. The expression 'linked by virtue of participating interests' in Articles 9 and 10 of the Directive suggests that the broader interpretation was intended. The phrase 'creating a durable link' used in the definition of participating interest applies equally to the company holding the participating interest and to that in which the interest is held.
 14. Where the company holding the participating interest and the company in which the interest is held are governed by the law of different Member States and where the presumption of a participatory link is based on different percentages, the question whether a participating interest exists is decided by reference to the law of the Member State in which the reporting company is established.
- 2.3.3. Subordinated loans in the balance sheet (Articles 9 and 10)
15. Subordinated loans are loans which, in the event of liquidation of the debtor company, are repaid after all other creditors have been satisfied but before shareholders receive any distribution.
 16. The balance sheet layouts in the Directive do not include a separate heading for subordinated loans. Subordinated loans may not be shown under 'Capital and reserves'. They are liabilities which must be shown under 'Creditors'. In order to emphasize the specific nature of these loans, it may be appropriate to create a specific balance sheet item for such loans and to give further details in the notes about the terms and interest rates of these loans.
- 2.3.4. Provisions for liabilities and charges (article 20)
17. Article 20 distinguishes between two categories of provisions. The provisions referred to in Article 20 (1) cover losses or debts, the nature of which is clearly defined and which, at the balance-sheet date, are either likely to be incurred or certain to be incurred but uncertain as to amount or as to the date on which they will arise. In addition to these provisions, Article 20 (2) permits Member States to authorize the creation of a further category of provisions. These are intended to cover charges which have their origin in the financial year under review or in a previous financial year.
 18. Provisions according to Article 20 (1) cover probable losses (arising from transactions in the course of settlement) and probable debts. The basic approach behind these provisions is that a relation to a third party exists (e.g. supply or service contract, legal proceedings, etc.). Provisions which meet these conditions must be formed irrespective of the profit or loss for the financial year in accordance with the general principle laid down in Article 31 (1) (c) (bb). This Article requires that account must

be taken of all foreseeable liabilities and potential losses arising in the course of the financial year concerned or of a previous one, even if such liabilities or losses become apparent only between the date of the balance sheet and the date on which it is drawn up.

19. Provisions according to Article 20 (2), however, do not cover provisions for losses and debts but only provisions for charges. These are expenses which have their origin in the financial year under review or in a previous financial year, the nature of which is clearly defined and which at the balance sheet date are either likely to be incurred or certain to be incurred but uncertain as to amount or as to the date on which they will arise. Although there is no obligation to a third party, the possibility to create a provision in this case gives companies the opportunity to calculate the profit or loss for the period more precisely. This is meant to cover, for example, major and recurring maintenance costs over a number of years and expenditure on major repairs.

2.3.5. Provisions for environmental liabilities and risks (Article 20)

20. The general conditions in Article 20 (1) of the Directive apply also to provisions for environmental risks and liabilities. Where Member States have implemented the option contained in Article 20 (2), it is also applicable to environmental charges.
21. Environmental liabilities or risks, which result from past transactions or events, qualify for recognition as a provision in the balance sheet, if:
 - a) the company has a legal or contractual obligation to prevent, reduce or repair environmental damage, or
 - b) the company's management is committed to prevent, reduce or repair environmental damage. Such commitment would exist, for instance, where management has little discretion to avoid action on the basis of statements of policy or intention, industry practice or public expectations or where the company's management has decided to prevent, reduce or repair environmental damage and has communicated this decision either internally to another company organ or externally.

2.4. Profit and loss account

2.4.1. Definition of net turnover (article 28)

22. In accordance with Article 28 of the Directive, the net turnover comprises the amounts derived from the sale of products and the provision of services falling within the company's ordinary activities, after deduction of sales rebates and of value-added tax and other taxes directly linked to the turnover.
23. The expression 'other taxes directly linked to the turnover' excludes excise duty. Unlike VAT, which is levied and reimbursed at each stage in the production chain, excise duty is normally paid only once by the producer when the product first leaves the factory. The most logical approach is therefore to regard excise duty as an inseparable part of the price of the product, which should therefore always be included in the net turnover.

2.4.2. Extraordinary items (Article 29 (1))

24. Article 29 (1) states that income and charges that arise otherwise than in the course of the company's ordinary activities must be shown as extraordinary income or extraordinary charges.
25. In modern accounting practice there is a trend whereby the number of items which are considered as extraordinary is decreasing.
26. The definition of extraordinary items in the Directive does not preclude that income and charges are only classified as extraordinary in rare cases. Different factors, such as the size and the

activities of the company, need to be taken into account when classifying items. The classification of an item as extraordinary or not may often depend on the size of the enterprise: the larger the business, the more often certain events may occur, with the consequence that they may be more correctly classified as ordinary items.

2.4.3. Environmental expenditure

27. Environmental expenditure is not explained in the Directive. Environmental expenditure may include the costs of steps taken by an undertaking or on its behalf by others to prevent, reduce or repair damage to the environment which results from its operating activities, or to deal with the conservation of renewable and non-renewable resources. These costs include, inter alia, the disposal and avoidance of waste, the protection of surface and groundwater, preserving or improving air quality, noise reduction, the removal of contamination in buildings, researching for more environmentally friendly products, raw materials or production processes, etc⁵.
28. Environmental expenditure should in most cases be treated as ordinary expenditure. Consequently it is normally to be expensed in the current period, i.e. the period in which it is recognized.

2.5. Valuation rules

2.5.1. Depreciation of fixed assets (Articles 31 (1) (b), 33 (3) and 35 (1) (b))

29. The purchase price of any fixed asset with a limited useful economic life must be depreciated systematically over its useful economic life (Article 35 (1) (b)).
30. The requirement to depreciate applies even where the fair value of a building is equal to or higher than the book value or where the estimated remaining useful life is unlimited or at any rate so prolonged that annual depreciation would be insignificant. The Directive requires that fixed assets, such as buildings with limited useful economic lives are depreciated over their useful economic lives. Depreciation serves to stagger the purchase price systematically over the useful life of the building.
31. The application of a valuation method which is not based on the purchase price is however not precluded. The application of such a method may be authorized within the meaning of Article 33. Where such a method is applied, the value adjustments must be calculated each year on the basis of the value adopted for the financial year in question (current value) (Article 33 (3)).

2.5.2. Split depreciation in the case of revalued buildings (Articles 32 and 33 (3))

32. The depreciation charge in the case of revalued buildings may not be split into a part which is based on the historical cost and which is charged to the profit and loss account and another part which is based on the revalued amount and which is charged directly to the revaluation reserve.
33. Article 33 (3) allows Member States to permit or to require that only the amount of the depreciation arising as a result of the application of the general rule laid down in Article 32 (purchase price) be seen under the relevant items in the profit and loss account and that the difference arising as a result of the valuation method adopted under Article 33 be shown separately in the layouts. This provision still requires the depreciation to be calculated on the basis of the value adopted for the financial year in question. It merely allows Member States to require or to permit the purchase price element of the depreciation to be shown under the

⁵ See also 'Paper of the Accounting Advisory Forum: Environmental issues in financial reporting', (Document XV/6004/94), European Commission 1995, page 5.

relevant items. That part of the depreciation charge which relates to the revalued amount may appear separately in the profit and loss account layout.

2.5.3. Determination of the depreciable amount (Article 35 (1) (b)).

34. The basis for depreciation, or the depreciable amount, is indicated in Article 35 (1) (b) of the Directive to be the 'purchase price or production cost'. In accounting practice, however, the depreciable amount of an asset is sometimes determined after deducting the residual value of the asset. Although the Directive does not contain a specific reference to residual value, the use of a residual value in the calculation of the depreciable amount of an asset is not contrary to the Directive.

2.5.4. Accounting for long-term contracts (Article 31 (1) (c))

35. Long-term contracts are generally understood to mean contracts which relate to work or services extending over a period of more than one year. There are different methods to account for this situation. One method is to take the profit from the contract into account only after final completion of the contract (completed contract method). Another method is to relate the profit to be taken into account to the proportion of the contract that has been completed at the end of the financial year (percentage of completion method). Both methods are allowed under the Directive.
36. The second method is however only allowed on condition that the prudence principle laid down in Article 31 (1) (c) is clearly observed. In other words:
- a) the total contract income must be known;
 - b) it must be possible for the proportion of work completed to be calculated accurately, and;
 - c) the work on the contract must be sufficiently advanced.

Furthermore, where a loss is anticipated on contract, a provision must be set up for the entire loss as soon as it is discovered.

37. Irrespective of the method chosen, appropriate information must be given in the notes of the accounts as to the method applied in accordance with Article 43 of the Directive.

2.5.5. Accounting for positive differences in exchange rates (Article 31)

38. The Directive does not specifically address the problem of accounting for the effects of changes in foreign exchange rates. Article 43 (1) requires that for items included in the annual accounts which are or were originally expressed in a foreign currency, the bases of conversion used to express them in local currency should be disclosed.
39. The question of how to account for translation differences in exchange rates has been the subject of a long-running debate in Europe⁶. While there has always been agreement on the fact that negative exchange differences should be charged to the profit and loss account as soon as they arise, doubts have existed as to the possibility of including positive differences in the profit and loss account.
40. Article 31 of the Directive does not exclude an interpretation whereby positive exchange differences may be included in the profit and loss account. Furthermore, this possibility exists for both short-term and long-term monetary items. Because of the existence of very

⁶ See for example 'Paper of the Accounting Advisory Forum: Foreign currency translation', European Commission, Office for Official Publications of the European Communities, Luxembourg, 1995

sophisticated financial instruments, it would indeed be arbitrary to operate a distinction between short-term and long-term monetary items.

2.5.6. Capitalization of borrowing costs (Article 35 (4))

41. Interest on capital borrowed to finance the production of fixed assets may, according to Article 35 (4), be included in the production costs to the extent that it relates to the period of production. The term 'production' in Article 35 (4) should not be interpreted too narrowly.
42. Borrowing costs relating to the construction of a fixed asset may equally qualify for capitalization. In the same way, borrowing costs relating to the acquisition of a fixed asset may also be capitalized provided the acquisition does not result in an asset being immediately ready for use or sale. Indeed, capitalization of borrowing costs presupposes that a substantial period of time is needed before the asset is ready for its intended use or sale. As far as acquisitions are concerned, this could be the case where components are being acquired which are then assembled.

2.5.7. Capitalization of environmental expenditures (Article 15 (2))

43. Where environmental expenditures are incurred to prevent or reduce future environmental damage or conserve resources, they may qualify for recognition as an asset if, in accordance with Article 15 (2) of the Directive, they are intended for use on a continuing basis for the purpose of the undertaking's activities and if in addition one of the following criteria is met:
 - a) the costs relate to anticipated environmental benefits and extend the life, increase the capacity, or improve the safety or efficiency of assets owned by the company, or
 - b) the costs reduce or prevent environmental contamination that is likely to occur as a result of future operations.

2.5.8. Valuation of inventories (Article 39 (1) (b))

44. Article 39 (1) (b) states that current assets should be shown at the lower market value or, in particular circumstances, another lower value to be attributed to them at the balance sheet date.
45. Although the Directive does not make any specific reference to the concept of net realizable value, it appears difficult to imagine any practical case where the lower value to be attributed to inventories at the balance sheet date is materially different from the net realizable value. The concept of net realizable value is therefore compatible with the Directive.

2.6. Notes on the accounts

2.6.1. Possible omission of certain items concerning undertakings in which participating interests are held (Article 43 (1) (2) and 45 (1) (b)).

46. According to Article 45 (1) (b), Member States may allow the disclosures prescribed in Article 43 (1) (2) concerning undertakings in which the company holds, either directly or indirectly, a participating interest to be omitted when their nature is such that they would be seriously prejudicial to 'any of the undertakings to which Article 43 (1) (2) relates'.
47. The reference to 'any of the undertakings to which Article 43 (1) (2) relates' covers not only those undertakings in which the company has a participating interest but also the holding company itself, since disclosure can be prejudicial in both cases.

2.6.2. Environmental information (articles 29, 42 and 43)

48. In general the following provisions in the Directive also apply to financial information regarding environmental matters that ought to be included in the notes on the accounts:
- a) Article 43 (1) (1) on disclosure of valuation methods applied;
 - b) Article 29 on disclosure of extraordinary items;
 - c) Article 42 on disclosure and details of provisions included under 'Other provisions';
 - d) Article 43 (1) (7) on disclosure of contingent liabilities, including narrative information in sufficient detail, so that the nature of the contingency can be understood.

2.7. Annual report

2.7.1. Environmental information (Article 46)

49. Based on Article 46, the following information regarding environmental matters could usefully be given in the annual report:
- a) where environmental issues are relevant to the financial position of the undertaking, a description of the respective issues and the undertaking's response thereto;
 - b) the policy that has been adopted by the enterprise in respect of environmental protection measures;
 - c) the improvements that have been made in key areas of environmental protection;
 - d) an indication of government incentives related to environmental protection measures, such as grants and tax concessions;
 - e) the extent to which environmental protection measures, resulting from changes in future legal requirements that have already been enacted, or substantially enacted, into law, are in the process of implementation;
 - f) if other quantitative or qualitative environmental information is provided in a separate environmental report, a reference to this report.

3. THE SEVENTH COUNCIL DIRECTIVE ON CONSOLIDATED ACCOUNTS ⁷

3.1. Group definition and scope of consolidation

3.1.1. Majority of voting rights in another undertaking (Article 1 (1) (a))

50. Article 1 (1) (a) of the Directive requires consolidated accounts to be drawn up where an undertaking holds a majority of the voting rights in another undertaking. The majority of the voting rights does not necessarily correspond with the majority of the share capital.
51. Where the undertaking in question has issued shares with plural voting rights, full account has to be given to these shares when determining whether a company should be included in the consolidation or not, even where those shares do not represent a majority of the capital. The

⁷ When the term 'the Directive' is used in this part it refers to the seventh Directive, unless other references are clearly made.

same principle applies to non-voting shares, i.e. the shares held by the undertaking concerned should be taken into account purely on the basis of the voting rights attached to them and irrespective of the proportion of the capital they represent.

52. For the definition of the parent-subsidiary relationship, the majority of voting rights should always be taken to mean a simple majority of all voting rights in a company. This applies even if the law, the memorandum or the articles of association require that all or certain decisions in a company can be taken only on the basis of a qualified majority. The parent-subsidiary relationship is not affected by provisions in the law, or the memorandum or the articles of association which limit the voting power of a shareholder or member to a given percentage of the total voting rights which is less than a majority of all the voting rights, irrespective of the size of his shareholding and the associated voting rights.
 53. The restrictions referred to in paragraph 52 must however be seen in the light of Article 13 (3) (a) (aa) which allows an undertaking not to be included in consolidated accounts where severe long-term restrictions substantially hinder the parent undertaking in the exercise of its rights over the assets or management of that undertaking.
 54. Where the proportion of capital and the proportion of voting rights held differ and consolidation has taken place on the basis of the majority of the voting rights, the notes on the consolidated accounts must include information concerning the basis on which the consolidation has been carried out, i.e. information as to the proportion of voting rights held (Article 34 (2) (a)).
- 3.1.2. Right to appoint or remove a majority of the members of the administrative, management or supervisory body of another undertaking (Article 1 (1) (b))
55. Article 1 (1) (b) requires consolidated accounts to be drawn up where an undertaking has the right to appoint a majority of members of the administrative, management or supervisory body of another undertaking (a subsidiary undertaking) and is at the same time a shareholder in or member of that undertaking.
 56. In principle this provision does not cover the situation in which a company is entitled, in respect of another company and on the basis of the memorandum or the articles of association, to appoint a minority of the members of one of the bodies mentioned and that minority holds a majority of the voting rights within the body in question. Consolidation is only required where the right exists to appoint or remove a majority of the board members.
- 3.1.3. Exclusion of subsidiaries with incompatible activities (Article 14 (1))
57. Article 14 (1) of the Directive states that an undertaking must be excluded from the consolidated accounts when its inclusion would be incompatible with the requirement to show a true and fair view. Even though the second paragraph restricts the scope of this Article, modern accounting practice gives this kind of exclusion an even more restricted role.
 58. Since the adoption of the Directive a development has taken place whereby more and more subsidiaries have been included in the consolidated accounts, regardless of the nature of their business compared with that of the parent undertaking. Preference is given to the inclusion of the subsidiary in the consolidated accounts with appropriate information (on a segmented basis) in the notes. Article 14 (1) should be read in the light of this development and exclusion from the scope of the consolidation should therefore only take place in very rare circumstances when the application of the true and fair view principle as described in Article 16 (3) so requires.

3.2. Preparation of the consolidated accounts

3.2.1. Consolidated balance sheet and profit and loss account (Article 17)

59. According to Article 17 of the Directive, the layouts of the consolidated balance sheet and profit and loss account are governed by the provisions in the fourth Directive (Article 9 and 10 and 23 to 26). However, adjustments resulting from the particular characteristics of consolidated accounts can be made. Those adjustments involve, firstly, those items which the seventh Directive specifically provides for to supplement those of the fourth Directive and which follow naturally from the consolidation process. Those items are the following:

- the positive or negative consolidation difference (Article 19 (1) (c))
- the amount of capital (Article 21) and profit or loss (Article 23) attributable to minority shareholders,
- the difference between the book value of a participating interest and the amount corresponding to the proportion of capital and reserves represented by that participating interest in the case of application of the equity method (Article 33 (2) (a) (b)) and the proportion of the profit or loss of associated undertakings to which the equity method has been applied (Article 33 (6)).

60. Article 17 (2) gives Member States the option to omit the classification of stocks between raw materials and consumables, work in progress, finished goods and payments on account, where there are special circumstances which would entail undue expense in providing such detailed information. Stocks may therefore be classified in accordance with the purpose most frequently used during the financial year.

3.2.2. Requirements when applying 'international' accounting rules (Articles 17 and 29)

61. If an undertaking which is required to prepare its consolidated accounts in conformity with the seventh Directive wishes to satisfy at the same time the requirements following from other rules such as International Accounting standards (IAS) or US generally accepted accounting principles (GAAP), this is only possible to the extent that the consolidated accounts remain in conformity with the seventh Directive. This is particularly relevant for the layouts of the accounts and for the valuation methods.

The consolidated balance sheet and profit and loss account must be drawn up in accordance with the requirements of the Directive. This means that no other adjustments to the layouts in the fourth Directive than those allowed by Article 4 of this Directive can be made.

As far as the valuation rules are concerned, Article 29 (2) allows Member States to require or to permit the use in consolidated accounts of valuation methods other than those used by the parent undertaking in its annual accounts. However, these other valuation methods must also be in conformity with the fourth Directive. No valuation methods may be used which are in conflict with those allowed under the fourth Directive.

10. ANNEX 4: PROJECT PROFITABILITY MEASUREMENTS. NPV, IRR AND NFV

Project profitability measurements. NPV, IRR and NFV

Profitability measurements consider the time when the flows take place and homogenise them in order to compare different distributions of flows and amounts. There are basically three of them: net present value (NPV), internal rate of return (IRR) and net final value (NFV). These are often used in studying the financial feasibility of projects. Studying this is one of the stages in the considering whether to carry out a project.

Studying a project involves a series of stages that involve answering each of the following questions:

- Is it feasible?
- Is it possible?
- Is it acceptable?
- Is it profitable?

Feasible. Projects are not always defined in ways that allow them to be carried out. For example, the technology we need to be more eco-efficient is often not available. This creates a situation in which the company cannot do the project, but nor can any other company since the technological conditions, customs or social habits required in order to carry it out are not available.

In that case, the sensible attitude would be to monitor the development of the technology and social behaviour and wait until the conditions change. That means foreseeing the possibility of technological change in the current system when a new technology arises.

Possible. This has a more applicable scope. It means accepting or not accepting a technology that your potential competitors can use. "Possible" implies that you have the necessary resources (technical, financial and human (training) resources). The need for an ideal capacity and size leads to more than a few projects being abandoned. A sensible attitude is to find a complementary size through strategic alliances (a joint venture, for example).

Acceptable. This concerns a decision-making level in which the emphasis is on foregoing the alternatives not chosen. Deciding means choosing, but it also means giving up. Giving up the alternatives that were not chosen, which are often also attractive. Take for example the use that may be given to a plot of land near a factory: a car park or a warehouse? They are mutually exclusive, but both certainly have advantages and disadvantages. We accept the risk of making a mistake. The desire to press on with the project remains and the ability of the assets to be used for more than one use is assessed (the mobility of the assets).

Profitable. This is the time to work out whether the project would add value to the company, and whether that value is in sufficient proportion (profitability) to the necessary effort and investments.

Let us focus on this last aspect: profitability. The measurements that allow you to understand this issue are measurements of cash flows at the heart of "financial feasibility", in which you basically calculate the financial needs to carry out the investments, the amount of financing needed, the break-even point and the project's profitability.

The metrics for financial analysis arise from the figures for the cash flow generated by the project.

Analysts minimise the complexity of the project by reducing their analysis to studying the monetary factors and equivalent values included in the project. They study the project's components in accordance with their consumption and contribution of monetary resources (cash flows). They identify three kinds of cycles in which cash resources are invested (are converted into assets) and are subsequently recouped, i.e. they study the money-assets-money cycles.

This point of view involves two conversions, foreseeably through a market and a purchase in which the ownership or use of the asset in question is transferred.



This way of operating often leaves out items for which there is no market or for which the ownership or use is not transferred, as is the case for public goods (scenery, air quality, etc.).

Analysts know of and identify three kinds of cycles in which money is converted into assets and these are invested and disinvested in the form of money:

- investment-amortisation cycle;
- operating cycle;
- financial transaction cycles.

These three cycles are the result of observing one of the necessary elements in carrying out a planned activity: considering them fungible or non-fungible (fungible assets are those used just once in the production process). Thus a nail would be considered fungible for a carpenter, and a hammer non-fungible. The classification depends on the process or productive activity. The same hammer would be fungible in a hammer shop.

Let us focus on two attributes of this cycle: the length of time it takes to carry out a complete cycle and the initial and final amounts of the cycle, as shown in the table below.

	Amounts		comparison	time
	initial	final		
I Amortisation of the investment	D1	D2	D1>D2	long
II Operation	D3	D4	D3<D4	short
III Financial transactions	D5	D6	D5><D6	long/short

One can thus see that the time needed to carry out an investment-amortisation cycle includes the possibility of carrying out different operating cycles and that financial transactions may take place over a long- or short-term time scale.

A distinction should be made for financial transactions between financial transactions that are lined with commercial exchanges (actual customer and supplier accounts, financial transactions associated with a purchase agreement with deferred payment) and, in a separate group, transactions in which the purpose was to provide the cash resources to obtain the initial figures in cycles types I and II in the above table.

Let us take a look at the figures and analyse their relationship. D_1 is an amount greater than D_2 . The difference ($D_1 - D_2$) comes from wear and tear, obsolescence or loss of capacity of the physical assets acquired, BF_1 , which are sold once they have been sufficiently used or have become obsolete.

In any case, its value becomes that of a second-hand product at lower prices than a new product. Such assets are not profitable in themselves. The reason they exist is due to their contribution to obtaining other products or assets: the operating cycle assets.

The difference in values D_4-D_3 is a recognition of how skilfully the process is being carried out, since the market values the resulting product more than its fungibles. This difference is known by the name of resources *generated* (through operation of the cycle). Despite being a positive difference (D_4D_3), to find out whether profits have been earned, one must consider the contribution of the non-fungible items to the process of producing the product sold.

This is the purpose of calculating the costs and calculating the operating profit/loss.

The result of operation is equivalent to the calculation performed from the resources generated by the operating cycle and the estimated value of the items consumed in the investment cycle (calculation of the economic amortisation).

Operating profit = Resources generated - economic amortisation (2)

In order to calculate the amortisation it is necessary to distribute and consider the difference (D_1-D_2) between all the operating cycles that use BF_1 .

The difficulty of working out the exact number of cycles involved makes it more attractive to estimate it annually. An estimate of the useful life of BF_1 then gains importance as a way of calculating the loss of value each year. This amount, the economic amortisation (AME), is determined as follows:

$$AME_{BF_1} = \frac{D_1 - D_2}{n} \quad (3)$$

Where n is the estimated number of years during which physical asset no. 1 will last (BF_1).

In fact, a project is the sum of different type I and II cycles with the relevant financing (type III cycles), meaning any investment project (cycles I and II) requires a financing project or set of financial cycles.

The simultaneity of investment cycles and financing cycles is guaranteed, just as there are many type I and II cycles performed simultaneously and not successively (one after the other). The accounting records must be used to work out the overall contributions of all the cycles over a period of time (accounting cycle).

Furthermore, when we analyse the flows in an investment and financing project, we use the hypothesis that all of the flows in a particular period coincide at a particular moment in time.

Analysts and accountants do a similar calculation: has the value of the company's resources in relation to the existing set of resources improved or worsened from one year to the next?

There are different answers to this question. An accountant tries to determine the profit/loss for the financial year to be allotted to capital and reserves, and an analyst determines the resources a project provides.

Note that accountants measure in terms of companies and periods and often in terms of projects performed (the historic view of the company), while analysts measure with regard to projects and carry out calculations before taking a decision on whether or not to start the project.

The accounting viewpoint, conveniently split up into projects, is a valuable project control tool (in the sense of controlling and comparing it with what was expected with what actually took place, as mentioned in section 3.2.).

The flows in a period are calculated by the project's financial analyst as follows:

Income	D_4
Operating expenses	- D_3
Resources generated by the operation	RGE
Economic amortisation	- AME
Profit before interest and tax	PBIT

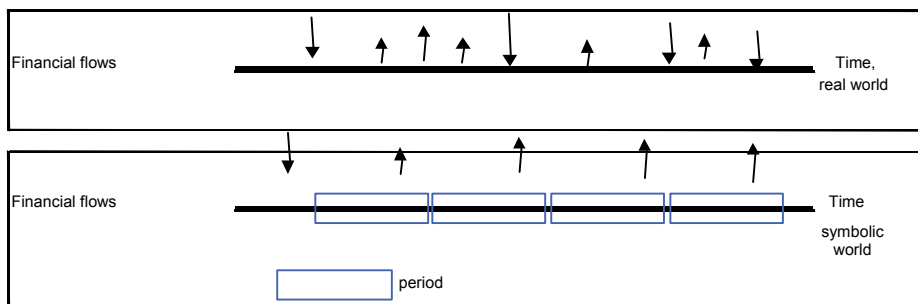
It is similar to the calculation that an accountant would carry out, which is as follows:

Income	I
Operating expenses (by periods)	- DE
Economic amortisation	- AEC
Earnings before interest and tax	EBIT

The two amounts, *PBIT* and *EBIT*, will be the same whenever the company carries out just one project, and the project's operating expenses do not involve any investments other than those needed to produce the income. In other words, there is no need to divide the operating expenses up into periods: you only buy what you consume. As a result, there are no advance expenses or variations in stocks or (foreseen) deferred expenses.

It is worth remembering here that the project calculations are worked out in terms of the future, while accountants look at the past; the two visions diverge as they have different objectives. Although an effort is made in accounts to determine the profit/loss to be allotted, a financial analyst uses the idea of cash flows to quantify the figures involved in financing projects and express the necessary cash amounts in terms of the amount and starting time (when it is necessary) and length (how long it will be necessary). We will follow the style of a financial analyst to continue the accounting viewpoint from chapter 4.

All the flows in a project in a time period can be shown in graphic terms, stating the figures applied and obtained in the project, as shown in the figure below:



The figure *PBIT* is for a cash balance before considering the effects of two figures: taxes and the financing project and the relevant flows involved.

Let us take a look at the second of these. In order to realise the income, as a monetary assessment of the products sold (B_4) it was necessary to make non-fungible assets (equipment) available, as well as a certain number of fungible parts, in the expectation of using them in the production process; i.e. stocks arising from the impossibility of having a supply at the same time and quantity as the fungibles are consumed in. These stocks must be financed, just as it is necessary to finance the granting of financial transactions to your customers. Carrying out financial transactions together with deferred purchase transactions is considered a source of financing. The amount of each of these is known as rotating funds. (When studying a balance sheet, the rotating fund is the equivalent of the sum of the amounts invested in customer balances plus balances of stocks minus supplier balances).

In order to estimate the contribution to the company's wealth, three ingredients are required:

- i) The expenses caused by consuming the parts sold as fungibles.
- ii) The involvement of non-fungibles.
- iii) The expenses of the financing projects that are necessary for all this.

The financing project flows are made up of flows from different financing cycles. The financing cycle flows are characterised by the exchange of an amount of money D_5 for a credit document, and the exchange of the latter for another amount of money D_6 . Comparing the two amounts gives the interest from the operation:

$$Nifin = D_6 - D_5$$

or

$$INdfin = D_5 - D_6$$

In the first case, in which there is financial income ($Nifin$), you are the one who receives interest due to putting an amount of money into financial transactions. Otherwise, if you obtain money on credit, the amount to be returned exceeds this figure. The financial expenses ($INdfin$) are shown in the financing project.

If one focuses on the entire project, both investment and financing, one will see that a certain amount of the resources provided by the operating cycles will be used to pay for the financing projects or to finance the increase in the financial needs of the rotating fund (transactions with customers, suppliers and variations in stocks of fungibles).

We can thus establish a cash account that shows the following values:

Resources generated by the operation	RGE
Needs arising from investment projects	+VAR (FR)
Needs arising from financing projects	- AMFIN
Needs arising from financing projects	- DESFIN
Change in cash (cash at bank and in hand)	=VARC

The needs arising from investment projects are maintenance, replacing items (repairs) and variation in the needs for financing the rotating fund. Unlike the first two, the last one (needs for rotating funds) can be positive or negative (freeing up resources and investing cash resources).

The financial amortisation or return of amounts of financial transactions and the expenses arising from the use of financial resources are two minor entries of cash amounts during a period.

The cash variation ($VARC$) situation may be a loss if $VARC$ is 0, and in that case a financing transaction is necessary in order to cover the cash deficit. On the other hand, obtaining $VARC$ 0 involves investing the money provided by your investment and financing projects. You need to reinvest these resources.

The foregoing model has left out the matter of taxes, which affects the projects unequally. Considering the tax expense of paying interest on loans, but not on the remuneration of the company's capital in the form of dividends, modifies the foregoing model by differentiating between the two sources of financing: from shareholders or owners, or from loans.

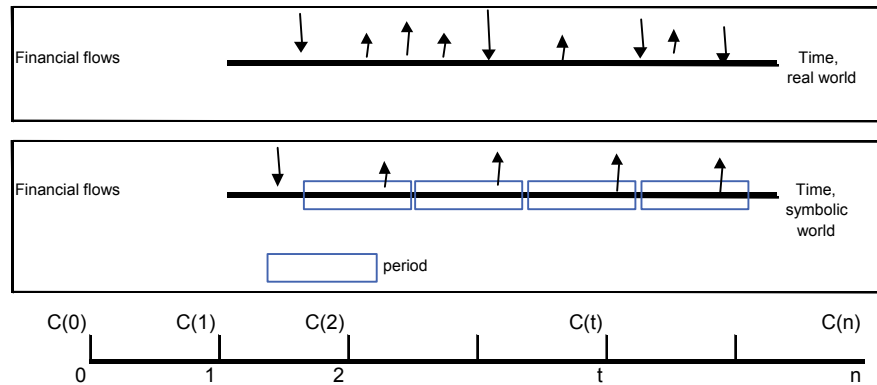
The structure of the cash account would be as follows:

	Variation in cash during a period (<i>t</i>)	
1	Income	<i>D4</i>
2	- Operating expenses	<i>D3</i>
3	- Tax on <i>EBIT</i> (= <i>EBIT</i> = (<i>D4-D3-AME</i>))	<i>T</i>
4	- Interest and other financial expenses	<i>DFIN</i>
5	- Tax deduction of outside financing expenses (= <i>DFIN</i>)	<i>DFIN</i>
6	- Dividends	<i>DIV</i>
7	- Financial amortisation	<i>AMFIN</i>
8	+/- Variation in rotating funds	+/- <i>VAR(FR)</i>
9	Variation in cash during period <i>t</i> 1-2-3-4-5-6-7-8	<i>C_t</i>

Note that:

1. The tax is the tax rate on profits applied to the results as a whole, regardless of the way in which they are financed (*EBIT*).
2. This situation involves a reduction in the cost of a financial transaction with capital on credit in the same proportion as the expenses arising from financing with outside capital (capital other than the capital provided by the owners or shareholders). The actual cost after the tax on the outside capital is the difference between values 4 and 5 in the table above.
3. Just like before, the variation in rotating funds allows for two positions: freeing up resources and needing new financing resources.
4. The sum of items 1, 2, 3 and 8 are a result of the figures in the investment projects, regardless of the way in which they are financed. This figure of the investment project flows (*a_t*) is used in different investment selection criteria, as we will see below.
5. The rest of the items are linked to financing options selected in order to finance investment projects, i.e. the financing project.

You need to calculate the different amounts of variations in cash (*C_t*) for each of the periods the project is split into, so you need to simplify the financial flows, reducing them to one figure at the end of the period.



Cash management is the way to arrive at this situation, maintaining the conditions of financial balance. These balance conditions apply to the entire project, which implies that any value C_t must be positive or 0.

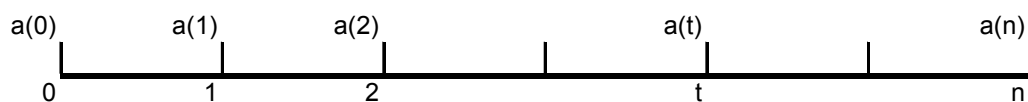
If the value of C_t is 0, that would mean that not everyone could be paid with the resources available or that the remuneration of the capital provided by the owners (internal financing) would be below that demanded by the capital market, with the risk of loss of confidence in the project or arriving at situations of lack of liquidity or bankruptcy.

In terms of activity forecasting, when C_t has a negative value, the financing and investment forecasts must be reformulated and the amount recalculated in order to arrive at a situation of financial balance: all $C_t = 0$.

As there are different forms of organisation, measurements and technologies, different projects can be used to carry out an activity. Insofar as they exclude one another, you can say that there are different alternatives from which you have to choose one. The selection criteria provide different ways of ordering and choosing them.

The following criteria take these figures into consideration in their calculations in order to determine the investment selection criteria. The modified recouping term, the net present value, the internal rate of return and the net final value are the ones most extensively used.

The figure below helps show the flows and values arising from the criteria:



After setting the analysis time horizon (up to period n), we determine the flows for each of the periods. As mentioned above, we group all of the flows together at the end of each analysis period. Note how the setting of the analysis period affects the amortisation calculation formula (see expression 3).

Modified recouping term

The time horizon may be determined by contract, or by technological, legal or financial reasons. A reduction in the time horizon for any reason has two effects: reducing the number of operating flows in the last periods and increasing the amortisation of all the flows, since there is a smaller value (n) in formula 3.

It should come as no surprise that the setting the necessary term for recouping the investment is an element that needs to be taken into account when defining a project.

The initial expression considers the values of a_t required to equal the initial amount paid out (the investments made, which we are calling D_1).

$$D1 = \sum_0^{pr} a_j \tag{4}$$

where pr is the number of periods required to recoup the investment.

This is a partial criterion that is not without its limitations. Let us take a look at a case in which we have three projects “A”, “B” and “C”, the flows of which are as follows:

	0	1	2	3	4	n
Project A	100	20	40	40		
Project B	100	20	40	40		
Project C	100	60	20	20		

Projects “A”, “B” and “C” have the same recouping term: three periods. This criterion would consider projects “A” and “B” to be equal and they could have this distribution over the forecast period.

	0	1	2	3	4	n
Project A	100	20	40	40	0	10
Project B	100	20	40	40	80	40

Projects “A” and “B” would no longer be equal according to any other criterion.

If you compare all the flows in project “B” and the flows in project “C”, you can see that they have the same total amount, but a different composition:

	0	1	2	3
Project B	100	20	40	40
Project C	100	60	20	20

Despite having an investment of 100 and return flows of 100 at the end of three years, you can see that the composition of the a_t flows makes project “C” preferable. It recoups more in the first few years. You can deepen this impression by including the current values of the flows from the investment project, and you can also compare homogeneous figures in terms of amount and time.

$$D1 = \sum_0^{pr} c_j * (1+i)^{-j} \tag{5}$$

This value pr for an updating rate ($i = 0.05$) would give the following values:

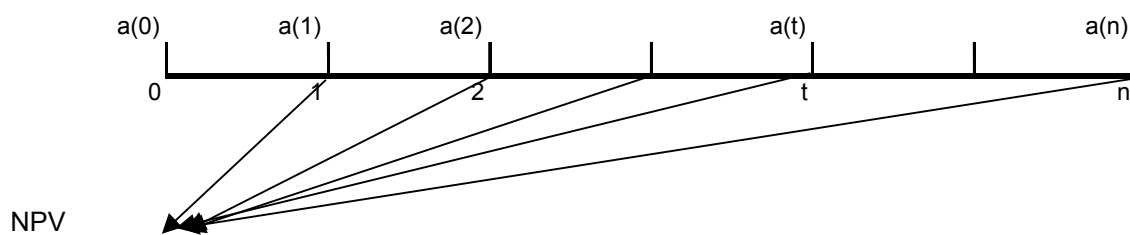
$i = 0,05$	0	1	2	3
Project 1	100	20	40	40
Project 2	100	60	20	20
Project 3	100	19.048	36.281	34.554
Project 4	100	57.143	18.141	17.277

The value recouped at the end of the third period would be 89.88 in project “B” and 92.56 in project “C”, which shows that project “C” would recoup the investment faster than project “B” in terms of discounted values.

The 10.12 units left to be recouped in project “B” are 15% of flow C_4 (if it were annual, it would take practically eight weeks) over three years and five weeks of recouping for the entire investment in the case of project “C”.

It goes without saying that according to this criterion it would be preferable to recoup the investment more quickly, i.e. leaving out the rest of the flows dated after this measurement.

The net present value (NPV) criterion



This considers all of the flows arising from the investment project along the entire time horizon, discounted at the initial point. In fact, it compares the invested value with the equivalent value at the same time as all the flows expected from the project.

The different flows of type D_1 and D_3 from the projects are jointly considered as a_0 .

The criterion is clear: the highest value project out of the projects considered, the highest NPV. The net present value (NPV) is expressed as follows:

$$VAN = a_0 + \sum_{t=1}^n \frac{a_t}{(1+i)^t} \tag{6}$$

Note that in all the calculations, the figures considered belong to the investment project (a_j), so as to give a figure that is significant in economic terms.

The internal rate of return (IRR)

This considers all of the investment project’s flows, but the figure to be considered is the value of i , such that it makes the initial investment (a_0) equal to the net present value of the rest of the flows from the investment project.

The IRR is expressed as the value of i :

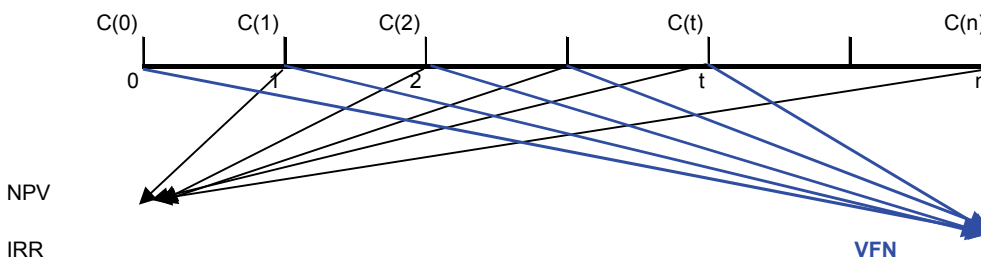
$$-a_0 + \sum_{t=1}^n \frac{a_t}{(1+i)^t} = 0 \quad (7)$$

The resulting value of i , the internal rate of return (IRR), is the maximum profitability that the investment project can provide. The criterion considers that, all other parameters being equal, the project with the highest rate of return will be chosen.

In this case you again use the investment project data and exclude the variables of the financing project that make it possible.

The next criterion provides a way to overcome this limitation: net final value (NFV).

The net final value (NFV)



The NFV considers the flows resulting from all of the investment projects and the financing flows (C_t) required throughout the project's lifetime, located at the end of the project's lifetime, at moment n . For that purpose, it considers a new variable: the average rate of investment of cash flows (C_t) from time t when they begin to the end of the project (n), which is shown as r or the rate of reinvestment. There is no reason why this should be the same kind of updating as used in the NPV criterion.

The expression is as follows:

$$VFN = \sum_{t=1}^n c_t (1+r)^{n-t} \quad (8)$$

The net final value (NFV) makes it possible to provide a response to shareholders concerning the additional wealth provided by investment and financing projects over and above the requirements for remunerating the capital and reserves. To put it another way: how much richer you will be compared to investing your funds in the stock market. The decision-making criterion involves choosing the project with the highest NFV.

11. ANNEX 5: QUESTIONNAIRE (IN ENGLISH, NOT FILLED IN)

Questionnaire

PART I

1.- SOCIAL IMPACT OF SMES IN YOUR COUNTRY

Approximate number of SMEs in operation:

Approximate percentage of employment created by SMEs.

	Percentage of employment
Between 0 and 20%	
Between 21 and 40%	
Between 41 and 60%	
Between 61 and 80%	
More than 80%	

Approximate percentage of SMEs' profits in relation to the country's GDP.

	Percentage of GDP
Between 0 and 20%	
Between 21 and 40%	
Between 41 and 60%	
Between 61 and 80%	
More than 80%	

2.- BUDGETARY IMPACT OF SMES IN YOUR COUNTRY

Amount of budget assigned to the ENVIRONMENT out of the total government budget.

	Percentage of the total budget
Between 0 and 5%	
Between 6 and 10%	
Between 11 and 15%	
Between 16 and 20%	
Between 21 and 30%	
More than 30%	

3.- REGULATORY SITUATION CONCERNING THE ENVIRONMENT

Are there detailed regulations for each of these areas?

Areas regulated	Level of development of regulations		
	General guidelines	Detailed development	Exhaustive
Atmospheric emissions			
Waste			
Dumping and waste water			
Water			
Environmental and sustainable policies			
Environmental management			
Others (1)			

(1) Which are considered important: please state.

4.- THE NATURE OF THE EXISTING REGULATIONS IS BASICALLY AS FOLLOWS:

Areas regulated	Nature of the regulations		
	Voluntary WITHOUT any explicit recognition	Voluntary WITH explicit recognition	Voluntary WITH explicit recognition
Atmospheric emissions			
Waste			
Dumping and waste water			
Water			
Environmental and sustainable policies			
Environmental management			
Others (1)			

5.- DETAILS OF THE ACTION AIMED AT SUSTAINABLE DEVELOPMENT PERFORMED BY COMPANIES IN YOUR COUNTRY

Action in the Areas of	A lot of action carried out	Little action carried out	No action carried out
Atmospheric emissions			
Waste			
Dumping and waste water			
Water			
Environmental and sustainable policies			
Environmental and sustainable policies			

6.- ENVIRONMENTAL OR SUSTAINABILITY COOPERATION AGREEMENTS ENTERED INTO

Total number of agreements	Number of agreements with MAP countries	Number of agreements with countries from the group to which they belong	Number of agreements with countries outside of the MAP

7.- STATE THE MOST IMPORTANT MODIFICATIONS THAT COMPANIES IN YOUR COUNTRY HAVE MADE REGARDING ENVIRONMENTAL MATTERS

- a) Technological modifications.
- b) Legal modifications.
- c) Clean production modifications.
- d) Sustainability modifications.
- e) Other modifications.

PART II (OPTIONAL)

- a) Do your country's regulations differentiate between rules that must be followed by large companies and SMEs?

No	A few differences	Many differences

- b) The extent to which the ENVIRONMENTAL REGULATIONS ARE COMPLIED WITH BY SMEs is basically as follows:

DEGREE OF COMPLIANCE			
LOW LESS THAN 30% COMPLIANCE	MEDIUM 30-65% COMPLIANCE	HIGH MORE THAN 66-85% COMPLIANCE	VERY HIGH More than 86% COMPLIANCE

- c) The effectiveness of the ENVIRONMENTAL REGULATIONS FOR SMES is basically as follows:

DEGREE OF EFFECTIVENESS			
LOW	MEDIUM	HIGH	VERY HIGH

END OF THE QUESTIONNAIRE. THANK YOU FOR TAKING PART

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LEAN PRODUCTION



Regional Activity Centre for Cleaner Production (RAC/CP)

Dr. Roux, 80 - 08017 Barcelona (Spain)
Tel.: + 34 93 553 87 90 - Fax: + 34 93 553 87 95
E-mail: cleanpro@cprac.org
<http://www.cprac.org>



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