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Business School**  
HANDELSHØJSKOLEN



## **MNCs Activities to Combat Climate Change in Developing Countries**

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## 1.0 Introduction

The 21<sup>st</sup> century is characterized by several challenging problems. One of the core problems that has emerged worldwide during the last decades is climate change.

Notwithstanding, this issue has not been considered as important as it should be. This aspect is underlined by the fact that the climate change issue is not present in the environmental or economic policy agendas of developing countries. As Noreen beg, OECD secretariat (2002) highlighted *“yet evidence shows that some of the most adverse effects of climate change will be in developing countries, where populations are most vulnerable and least likely to easily adapt to climate change”*.

Nowadays, it is more obvious that business will play a vital role in the future health of our planet. As pointed out by Palazzi (1997), business leaders recognized that economic growth and environmental protection are closely linked. Climate change can therefore be considered as an international environmental issue.

For some years, there has been a change in the mentality of people, companies, governments and organizations. It has been recognized that the climate change problem cannot be considered as an issue to be solved in the future.

As underlined by Daly and Pachauri (2009), this represents a profound threat for both human and nonhuman species and therefore it is fundamental to start activities in order to tackle it.

To make everyone more concern about the climate change issue, both marketing and communication represent channels that could play a fundamental role to increase the awareness on the above-mentioned matter. Needless to say that this is not enough: as pointed out by Shah (2010), more has to be done to tackle climate change. It is significant to underline that currently the majority of the companies already created an inventory regarding their greenhouse gases (GHG) emissions (Kolk, 2004).

In order to reduce GHG emissions, the vast majority of MNCs decided to focus on internally oriented measures that improve energy efficiency of their business processes.

At the same time, however, a growing number are exploring possibilities to integrate the supply chain in its climate strategy and develop new products, characterized by being energy efficient. (Kolk 2004).

To better understand why climate change is so important and how much there is still to do in order to tackle it, it is important to focus on the following statement: *“climate change is, in theory, the perfect topic for an international environmental agreement. All countries are affected by, and*

*contribute to, the build up of greenhouse gases, and should be willing to join in the effort to stop it. However, it is far from easy to agree what to do, and how to do it” (Panos, 2000).*

The topic I developed in this paper is based on the importance of multinational corporations (MNCs) climate change activities in developing countries. The climate change issue in developing countries represents a very important topic for MNCs for several reasons. First of all, as underlined by Stiglitz (1998), the number of activities undertaken by MNCs in developing countries is steadily increasing. It is very important to take into consideration the fact that some MNCs have started seeing the need to address climate change in developing countries, but, as highlighted by Makwana (2006), that is still a minor issue on the corporate agendas.

Thus, by understanding the practices of those MNCs engaged in climate change activities in developing countries and identifying what drove them towards implementing these activities, important lessons from other MNCs and policy makers might be drawn.

It is important to have a clear understanding on what MNCs do in developing countries for several reasons, especially to understand if there is an efficient model that could be used by any firm to combat the climate change issue. Moreover, it is remarkable to comprehend what are the reasons that foster MNCs to get involved in activities to tackle the above-mentioned issue.

In addition to what stated above, the focus is on developing countries since those are the nations that will be affected most by the climate change issue and also because, as pointed out by Pachauri (2008), in the future the CO<sub>2</sub> emissions of those countries will overtake the one released by developed nations.

I submit that there are three reasons that explain the importance of this research. It is promising in literature to discuss what is driving MNCs to get involved in combatting the climate change issue and three different explanations are worthy of note. The first reason is related to empirical purposes based on understanding the scope and the content of MNCs in developing countries.

In addition to that, it is remarkable to explain MNCs operations, their solutions applied in order to solve problems related to climate change in developing countries and their significant impact (Sadowski, 2003). The second reason concerns firms' strategic implication. Petkoski (2003) underlined that firms decide to get involved in activities in developing countries in order to learn how to operate in those diverse markets and likewise because they have the possibility to benchmark themselves. The third reason focuses on the fact that, as pointed out by Levy (2002), MNCs actions against climate change represent an issue that so far has been neglected by the literature. Due to the fact that this topic so far has not been taken into deep consideration, my aim is to fill this gap present in the literature related to this specific issue.

## 1.1 Research question

**What are the climate change practices of MNCs in developing countries? What are the driving forces of these practices?**

In my paper I will analyze the following aspects related to MNCs activities in developing countries to combat climate change: first of all, I will illustrate what practices are adopting and furthermore what the main reasons are that push firms to take an active part in combating climate change issues in developing countries.

Various hypotheses will be presented to draw a conclusion concerning the above-mentioned issue.

The majority of firms worldwide still have the national government as focal point in their political activities. The main difference is that in countries with strong government pressure for climate change, this more often takes the shape of providing policy input, whereas in countries with low government pressure, participation in voluntary government programs tends to prevail (Kolk, 2007). This work provides an overview of emerging business strategies to tackle climate change in developing countries. The importance of my research question is highlighted by the fact that, at the present time, climate change represents a focal issue for states, private companies as well as other organizations. It is necessary to understand whether firms are really interested in challenging this aspect or if they get involved just to earn a good reputation.

The importance for companies to be involved in actions to combat climate change is related to the fact that this allows them to earn important advantages in different fields.

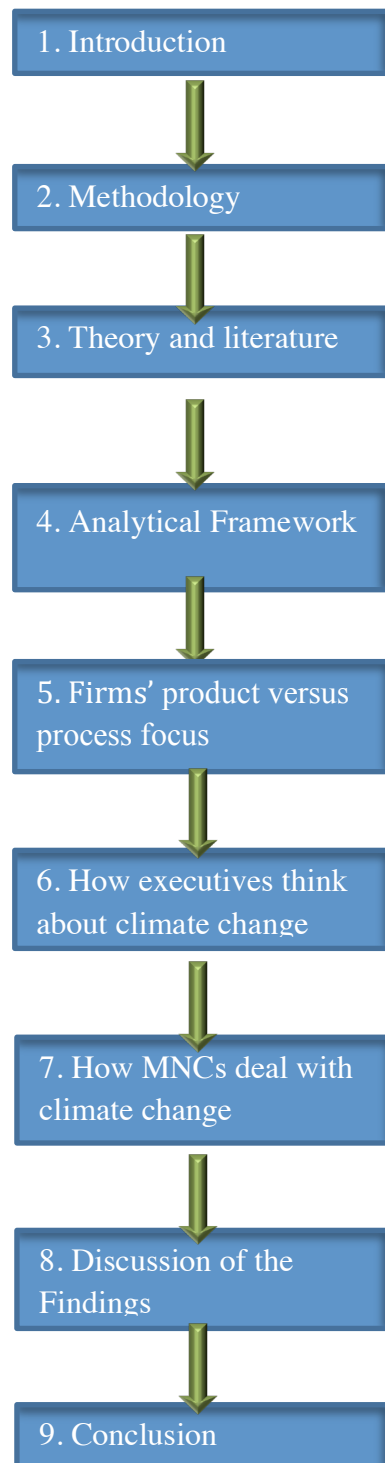
Besides that, it is important to clarify that the focus of my project is on developing countries since these are the countries, which will be affected the most by the climate change, as pointed out by the United Framework Convention on Climate Change (UNFCCC, 2007).

Furthermore, so far there has been too little research on this topic, thereafter there is a need to fill the gap in the literature concerning this issue.

In light of the above, those are the main reasons that drove me to ask how firms are combating climate change in developing countries and why they decided to get involved in this issue.

On the basis of my findings I will seek to make recommendations for future improvements.

## 1.2 Demarcation



## 2.0 Methodology

This section will present and explain the research methodology used in order to answer the research question of the project. Furthermore, it will describe the methodological approach, the research strategy, employed empirical data and sources. At the end, I will assess the fulfillment of the project requirements.

### 2.1 Methodological Line

Here, I will combine an academic approach from the requirements of Copenhagen Business School (CBS) and apply this together with the practical data obtained through interview and surveys. The core purpose of my work is to provide new insights into the subject applying theory from the world of Academia on areas that have yet to be analyzed in depth.

The main reason why I decided to focus only on few theories is because they are the most representative of the issues researched in this project and moreover because they are the most suitable to find an answer to the research question.

In order to conduct a proper research, Yin's (2009) research methods guideline will be applied to create my methodology. According to Yin (2009), research methods must not be arranged hierarchically. Distinguishing between various research methods requires going beyond hierarchical stereotypes. It is more appropriate to take an inclusive and pluralistic view because, as Yin (2009) states, every research method can be used for exploratory, descriptive, and explanatory purposes (Yin, 2009). Besides that, there are still a lot of social scientists that consider case studies on the one hand only appropriate to the exploratory phase of an investigation, while on the other hand surveys and histories are best suited to the descriptive phase. Experiments are still considered as the only way of doing explanatory or causal inquiries (Yin, 2009).

Furthermore, Yin (2009) describes the three conditions for choosing the most appropriate research method. These are the following:

- 1) The type of research question. Concerning the "what" question there are 2 possibilities:
  - Namely an exploratory study with the goal of developing hypotheses and propositions for further inquiry (Yin, 2009)
  - "What" question may also be posed as, "how many" or "how much". Related to my specific case, the "what" question is the following: What are the driving forces that push MNCs to tackle climate change problems in developing countries? In a similar vein, "who" and

“where” (also “how many” and “how much”) questions are better suited to survey methods or the analysis of archival data. Related to my project, “where” refers to the choice of developing country in which MNCs decide to start tackling climate change.

Survey and archival analyses have an advantage where the aim of the research is to describe the incidence or prevalence of a phenomenon or when it is to be predictive about certain outcomes (Yin, 2009).

A significant survey, created by McKinsey (2007) based on how companies think about climate change will be illustrated in chapter 6.

The main purpose of that survey is to depict how strong is the climate change interest within companies and what they do in order to tackle that issue especially in developing countries.

“How” and “why” questions are more explanatory and therefore better suited to case studies, histories, and experiments. This is because they deal with operational links that need to be traced over time. Related to my project, the “how” question present is “how are MNCs addressing climate change problems in developing countries?”

Concerning the “why” question related to my project, it has to do with why firms decide to get involved into actions to combat climate change in developing countries.

The second conditions for choosing the most appropriate research method is related to the extent of control over behavioral events while the third one has to do with the degree of focus on contemporary as opposed to historical events (Yin, 2009).

In order to understand the philosophy of management research, Easterby-Smith (2008) highlights a clarification of some concepts since they are often used interchangeably leading to confusion regarding their meaning. These concepts are the following: ontology, epistemology, methodology and methods.

<b>Ontology:</b> Philosophical assumptions about the nature of reality
<b>Epistemology:</b> General set of assumptions about the best ways of inquiring into the nature of the world
<b>Methodology:</b> Combination of techniques used to enquire into a specific situation
<b>Methods:</b> Individual techniques for data collection, analysis (Easterby-Smith, 2008)

**Table 1: Ontology, epistemology, methodology and methods. Source Easterby-Smith (2008)**

In my project I decided to take an ontological position, focusing on having a deductive approach. First an explanation of what firms do in regards to the climate change issue will be explained and analyzed first, whereas the “why” aspect will be taken into deep analysis afterwards.

There have been several debates among philosophers of natural science between realism and relativism. Easterby-Smith (2008) points out the following definition of realist: *“traditional realists start with the position that the world is concrete and external and that science can only progress through observations that have a direct correspondence to the phenomena being investigated”*.

This extreme position has changed over the years and has been modified by philosophers pointing to the difference between laws of physics and the knowledge scientists have on these laws. This is called transcendental realism.

On the one hand, internal realists accept that scientific laws once they are discovered are absolute and independent of further observations. On the other hand, the relativist takes this *“further in suggesting that scientific laws may not be quite so immutable”* (Easterby-Smith 2008). Thus, the discussion between realists and relativists goes on whether scientific laws are absolute and independent. When a researcher uses a specific epistemology it usually makes the researcher use methods, which are characteristic for this specific epistemology (Easterby-Smith, 2008)).

The table below, realized by Easterby-Smith (2008), describes the methodological implications of different epistemologies within the social science.

<b>Social science epistemologies</b>	<b>Positivism</b>	<b>Relativism</b>	<b>Social constructionism</b>
Elements of methodologies			
Aims	Discovery	Exposure	Invention
Starting point	Hypotheses	Propositions	Meanings
Designs	Experiment	Triangulation	Reflexivity
Techniques	Measurement	Survey	Conversation
Analysis/interpretation	Verification/ Falsification	Probability	Sense-making
Outcomes	Causality	Correlation	Understanding

**Table 2: Methodological implications of different epistemologies within the social science (Easterby-Smith, 2008)**

The table below shows the strengths and weaknesses of different epistemologies (Easterby-Smith 2008).

<b>Strengths and weaknesses of different epistemologies</b>		
	<b>Strenghts</b>	<b>Weaknesses</b>
<b>Positivist</b>	Can provide wide coverage Potentially fast and economical Easier to provide justification of policies	Inflexible and artificial Not good for process, meanings or theory generation Implications for action not obvious
<b>Relativist</b>	Accepts value of multiple data sources Enables generalisations beyond present sample Greater efficiency including outsourcing potential	Requires large samples Cannot accommodate institutional and cultural differences Problems reconciling discrepant information
<b>Social constructionist</b>	Good for processes, and meanings Flexible and good for theory generation Data collection less artificial	Can be very time consuming Analysis and interpretation are difficult May not have credibility with policy makers

p. 71-73 summed in this table.

**Table 3: Strengths and weaknesses of different epistemologies (Easterby-Smith, 2008)**

Relating the above-mentioned different kind of epistemologies to my project, it is significant to point out that all the strengths of these three different types of approaches have been implemented. It is possible to notice the relativist approach in the application of multiple data sources related to all the different projects that companies are involved in to combat the climate change issue in developing countries. The social constructionist method has been very important for theory generation, when different authors and theories have been presented to explain the different reasons companies tackle climate change.

## 2.2 Research Strategy

In order to generate knowledge and therefore reach a conclusion about the subject chosen, I will apply several frameworks about how firms decide to get involved in actions to combat climate change in developing countries. The dependent variable is MNCs climate change practices in developing countries.

## 2.3 Empirical Data

The project will be carried out through the application of different kinds of data, such as primary, secondary, tertiary and mostly quantitative data.

To have a better understanding of these different data, primary will be the data obtained in the form of interviews, market and industry reports as well as sources developed from a wide range of contributors such as governments, unions and independent academics.

Concerning this part, in my project I analyzed both industry and organization reports. Related to the former, I focused my attention on Vestas annual report (2010) and on Novozymes annual report (2010). About the latter type of report mentioned above, I conducted a deep analysis on the World Business Council for Sustainable Development report (2009) and on the Ceres annual report (2006). Part of the primary data will be quantitative and part qualitative, thus constituting a mixed method approach.

The secondary data will be the one obtained through databases and other relevant sources. Secondary data is gathered from external sources such as academic journals, industry studies, books and market data in order to create credibility and reliability through data triangulation (Yin 2009; Marschan-Piekkari & Welch 2004).

All references and the interview conducted are listed at the end of this study in order to enable potential reproduction of this study. Tertiary data will be in the form of indexes, citation indexes.

Part of the data for this project is gathered through an interview with Novozymes sustainable manager Claus Frier. The interview has been semi-structured and conducted via telephone on the 11th of April 2011. The interview language was English.

The interview data gathered were mainly used to form an initial view of the company's strategy concerning the development of alternative and sustainable ways on how to tackle climate change in developing countries and to work as a platform for further investigations and secondary data analysis. To reduce the information and data obtained during the interview, I followed the guideline provided by Miles and Huberman (1984).

They point out that one goal in marking what is of interest in the transcripts is *“to reduce and then shape the material into a form in which it can be shared and displayed”* (Miles and Huberman, 1984). *“Reducing data is a first step in allowing the researcher to present interview material and then to analyze and interpret it”* (Wolcott, 1994).

## 2.4 Assessment of Methodology

As stated above, I decided to focus my attention on understanding how MNCs address climate change problems in developing countries. My exploratory study aims to comprehend and analyze the current situation of MNCs activities concerning climate change in developing countries.

There are different reasons why firms decide to get involved into these kinds of activities.

Hence, it is not possible to provide a unique explanation to understand why companies want to tackle climate change in developing countries. Therefore, within the scope of this project, I will seek to give a clear overview on the different reasons that push firms to play an active role against climate change in developing countries. In order to make the project the most reliable possible, different kinds of sources have been implemented. A few economic theories form the framework from which this project draws upon its structure and approach.

According to Yin (2009), four tests have been commonly used to establish the quality of any empirical social research. The following is the core of the section:

1. **Construct validity:** identifying correct operational measures for the concepts being studied (Yin 2009). I have applied both operationalized strategies and systems.
2. **Internal validity:** its main aim is to be able to establish a causal relationship, in which definite circumstances are believed to lead to other circumstances (Yin, 2009).

Concerning internal validity is important to underline that all the independent variables present lead to the dependent outcome. In my project, the dependent variable is the following: MNCs practices to combat climate change in developing countries.

3. **External validity:** defining the domain to which a study's findings can be generalized. Critics often say that single cases offer a poor basis for generalizing (Yin 2009). However, this is a wrong interpretation as the critics see case studies as equivalent to survey research where a sample is intended to generalize to a larger universe. Therefore, external validity has to do with how much it is possible to generalize from the cases analyzed in the project, what it is possible to mention concerning those cases and, besides that, what is that could be saved from them.

Different cases concerning several companies have been taken into consideration and into deep analysis in my project. There are certain aspects that could be generalized by using a different number of case studies related to several industries that started activities in different countries.

4. **Reliability:** this is based on the fact that, through an efficient data collection procedure, it is possible to show that the operations realized within a study can be repeated with the same results (Yin, 2009). The goal of reliability is to minimize errors and biases in the study. Through the usage of several sources, the reliability of this research will be critically examined.

Two tactics for doing this:

- 1) To keep a case study protocol to deal with the documentation problem in detail
- 2) The development of a case study database (Yin 2009)

To have a clearer understating on what reliability is, it is important to take into consideration what Silverman (2005) pointed out. This author proposed to present more detailed information in the research. This has to be done mainly to avoid relying solely on the researchers' interpretation.

Besides that, Silverman (2005) points out that to ensure reliability and validity, it is fundamental to show *“your audience the procedures you used to ensure your methods were reliable and your conclusions valid”* (Silverman, 2005).

To ensure a high reliability in my research I decided to conduct an interview in order to acquire the point of view of who is personally engaged in a firm that started activities to combat climate change. Furthermore, data from different sources have been compared and analyzed to avoid providing a single-minded or biased way of thinking.

Thanks to the adoption of an appropriate theory for both the qualitative and quantitative data taken into consideration in this project, transparency in terms of sense making is produced (Saunders et al, 2009). The purpose is to provide a diverse range of inputs and therefore this can be done by triangulating and validating the accuracy of the information. By triangulating, the answers found are sought to be consistent and thereby not biased.

## 2.5 Time Horizon

The time horizon of the project takes into consideration a development over a longer period of time. It takes place in a context of rapid changes since the number of MNCs involved in action to combat climate change is increasing day by day. I found very interesting to analyze MNCs activities to combat climate change in developing countries for several reasons: first of all, climate change represents an issue that is becoming more and more important worldwide everyday. Besides that, I reckon truly stimulating to see how different firms use different strategies to tackle the same issues. Furthermore, it is very important to explain all the different reasons why firms decide to get involved in these activities. During the next few years, things might change, new strategies arise and new firms might decide to follow the sustainable path.

### 3.0 Theory and literature review

This chapter will present and explain the different theories that will be used to create an analytical framework to discover what steps firms are taking related to the climate change issue in developing countries. Moreover, different authors have been taken into consideration to explain the different reasons why firms decided to deal with the climate change problem. All the relevant literature, in order to get a theoretical understanding of MNCs practices to tackle the climate change issue in developing countries, have been reviewed.

The main reason why I decided to focus only on few theories is because they are the most representative of the issues researched in this project and moreover because they are the most suitable to find an answer to the research question.

#### 3.1 What firms do on climate change?

Before analyzing the reasons why firms decide to take on the problem of climate change in developing countries, I focused my attention on what firms do in order to solve this issue. Firms developed different plans and programs in developing countries. It is very important to point out that every firm decides to tailor its strategy according to the core characteristic of the nation in which it decides to get involved in. Although some countries have several aspects in common, Naguib (2008) highlighted the fact that numerous risks might be encountered to adapt the same strategy in those countries, without taking into consideration the differences present at different levels such as political, economical, geographical and cultural.

Governments all over the world imposed regulations that include, among the others, a reduction of emissions for large greenhouse gas producers (Bracmort et al, 2011).

As stated by Darkin (2007), one of the main reason that foster firms to take into account climate change as an urgent and serious issue is related to the fact that a strong connection is present between climate change and energy. Therefore, this issue will indisputably influence the firm's ability to provide products and services. Due to this fact, all firms will be influenced, no matters what their size is.

The dependent variable of the whole project is the following: MNCs practices to combat climate change in developing countries. As presented in the Jantzi-Sustainalytics research (2011), already a high number of companies established plans to reduce their GHG emissions, to moderate their waste and to be more sustainable. The focus of my project on developing countries is illustrated by

all a series of activities that companies started in those countries. The focus has not been only on developing countries present in the same continent but an overall overview on the main projects realized has been implemented.

As pointed out by the Management Consulting Group Kurt Salmon (2011), at the present time it is not complex anymore for managers to realize how the performance of their companies related to climate change does have an important effect on the companies' financial performances.

As underlined by Greenall and Johnson (2010), who work for the Deloitte's sustainable and climate change group, climate change disclosure can do more. Greenall and Johnson (2010) pointed out that when a firm decides to get involved into policies to combat climate change, it has to present relevant information to investor decision-making needs. Within the firm, it is fundamental to focus on the following points:

- **Strategy:** it is very important for climate change to become part of the company's core business strategy because it cannot be considered just as an option (Greenall and Johnson, 2010)
- **Systems and processes:** firms need to start up processes to evaluate and manage financial opportunities, threats, and impacts associated with the adaptation to climate change
- **Communication:** to provide climate management information, it is very important for firms to create data and information management systems (Greenall and Johnson, 2010)
- **Projects:** all the different firms analyzed in my project developed different types of projects in developing countries to tackle the climate change issue

In light of the above, it is possible to classify different kinds of activities MNCs are taking against climate change in developing countries.

These are:

- Strategy/ Policies
- Organization and procedures
- Outreach/ Communication
- Projects

### 3.2 Overview on diverse reasons to combat climate change

This section is characterized by an analysis of several authors, who provide examples of distinctive points of view on the different reasons that push firms to get involved into activities to combat climate change in developing countries.

The following authors have been chosen due to the fact that each of them gives a clear understanding on the different reasons followed by MNCs to tackle climate change. Furthermore, all the authors analyzed are the most representative to the cases researched throughout the whole project.

#### 3.2.0 Hansen (2003)

Hansen (2003) illustrates an outline concerning firms that decided to get involved into action to combat climate change in developing countries for both reputation and market reasons. Furthermore, Porter and Kramer (2006) focused their attention on CSR and on explaining the moral purpose of business. In addition to the authors stated above, Levy and Kolk (2002) illustrated the legal reasons why firms decide to tackle the climate change issue in developing countries.

Concerning reputation purposes, it is very important to underline the fact that firms decide to get involved in sustainable action to have a good reputation, but there are different reputational risks firms should be aware of before starting their strategies.

As pointed out by Hansen (2003), reputation represents a very important issue to take into consideration since it may affect the environmental investment and control strategies of TNCs.

This issue plays a very important role in three different ways:

- *“A market solution may entail significant reputational risk for a transnational corporation (TNC), not only for the affiliate but also for the brand and company name worldwide”* (Hansen, 2003). This is due to the fact that may not follow the guideline stipulated in the contract. Therefore, in order to overcome this risk, for a firm is safer to organize the production of that particular service internally
- Furthermore, as pointed out by Hansen (2003), TNCs can acquire a negative reputation not due to their own mistakes but due to the environmental performance of their suppliers
- Finally, *“firms selling products and services that are environmentally sensitive may ultimately be encouraged to integrate the downstream marketing, sales and after-sales-*

*service functions to avoid being associated with inappropriate marketing, use, storage and disposal of products” (Hansen, 2003)*

Another very important reason why firms decide to get involved into activities to combat climate change is because they are truly keen on opening up towards new markets (Hill, 2008). This will give a possibility to a firm to meet new customers, become more international and develop new products according to the characteristic of the market it just joined.

Therefore, the main market opportunities refer to growth, demand and market segmentation (Lambin, et al. 2007). It is very important to always take into account the fact that MNCs are market-seeking firms, attracted by market’s growth and size (Stopford, 1998).

Besides that, positive consequences that a company can obtain entering a new market are related to industry opportunities, such as resources both natural and human and government’s incentives (Lambin, et al. 2007).

The expression human resources refer to the fact that most of the time firms decide to enter a market characterized by cheap and skilled labor force (Hansen, 2003). Thanks to that, companies can produce more at cheaper prices. Some companies take the decision to open up towards new markets also pushed by the possibility to find technology assistance, lower-cost manufacturing and other services in order to maintain a competitive advantage.

Hansen (2003) points out that for firms it is possible to gain a competitive advantage in terms of:

- Abundant natural resources
- High assimilative capacities
- Social tolerance for pollution (Hansen, 2003)

These aspects represent the typical way in which developing countries and emerging markets obtain a competitive advantage towards the developed world (Walter, 1975; Pearson, 1985; Leonard, 1988).

Furthermore, firms can obtain new ideas by opening up towards new markets. Having the possibility to create a work force formed by people coming from different cultural backgrounds can bring fresh ideas and concepts to help a company grow (Serrat, 2009). There are several companies that recruit individuals from diverse backgrounds and the main reason why they do that is because they believe all this differentiation can create a competitive advantage that drives innovation and benefits customers (Serrat, 2009).

In addition to that, diversification can be seen as another very important aspect. Selling services and products internationally reduce the company's exposure to political and economical instability that could take place in a single country (PwC Advisory and Eurasia Group, 2006).

Moreover, as presented by Hansen (2003), entering a new market can give a company also the possibility to acquire first mover advantages, such as:

- Establishing market and brand
- Access and control distribution
- Influence customers
- Setting standards
- Early learning
- Access to supplies
- Optimal location
- Government goodwill (Hansen, 2003)

When a firm has good connection with local government and authorities, everything runs faster and more smoothly. It is fundamental to have a good network in order to succeed when a firm wants to enter a new market.

In order to develop a deeper analysis concerning how locational factors can improve foreign investors' environmental strategies, the journal of transnational management development (2003) points out very interesting aspects.

This paper reaches the conclusion that *"internalization, not location, may be the more significant aspect of the investment-environment nexus"* Hansen (2003).

There are at least two elements companies should take into consideration concerning environmental factors when they decide to invest.

The former has to do with the fact that transaction costs should explain the reason why firms decide to improve their production through FDI in order to avoid high costs, the so called "industrial flight" to "pollution havens" (Leonard, 1988).

The latter factor has to do with the fact that *"transaction cost factors may explain investment behavior by firms possessing environmental ownership advantages"* (Hansen, 2003). At this stage, it is important to mention the difference that there is between firms in the environment goods and companies where environmental competencies provide the firm with a competitive edge (Hansen 2003). There has been an increasing need for environmental protection to rise especially after the integration of least developed countries (LDCs) into the global economy. This is related partly to

growing environmental concerns in those markets. This creates a rapidly growing market for environmental goods and services in LDCs (Bangshøj et al, 2001).

Once Western companies realize that they have the chance to exploit massive market opportunities, they will do so through focusing their attention on foreign direct investment (FDI), as pointed out by Ali and Guo (2005).

In addition, another reason why MNCs prefer direct investment is because the majority of host countries, especially least developing countries, do not offer any patent protection, as illustrated by Moosa (2002). Therefore, there are high risks for firms to have their environmental technology copied by local operator.

Due to the fact that nowadays a lot of attention is based on the firm environmental profile, there is the possibility for companies to gain a competitive advantage thanks to the possession of environmental competencies. Therefore, it is possible to state that the decision to internalize production across borders through direct investment it is fostered by environmental factors (Morgan, 1997).

After explaining the main reasons how environmental factors influence the investment decision, it is fundamental to point out that there are different kind of entry mode a firm can follow (Hansen, 2003).

### **3.2.1 Porter and Kramer (2006)**

The importance of corporate social responsibility is increasing more and more everyday.

As underlined by Porter and Kramer (2006), nowadays CSR represents a fundamental priority for firms to focus on. This is related to the fact that recently different organizations developed ranking based on companies CSR performances (Porter and Kramer, 2006). The attention given to these rankings has been steadily increasing for some time. The main reason why CSR has become very important during the last decades is due to the fact that there has been a shift in the value system. There has been an increase in the regulatory pressure as well as in both the financial and in the consumer goods market. The result of this rise of pressure has been the implementation of CSR strategies (Smith, 2003).

Regulatory pressure refers to the fact that international organizations such as UN, OECD and EU created good behavior principles that need to be followed by every company, as highlighted by Petkoski (2003).

Furthermore, there has been an increase in the number of NGOs and consultancy firms, since they need to measure and certificate firms' initiatives (O'Brien, 2001). As for consumer pressure, people have started purchasing products created according to CSR criteria (Mohr, 2001).

Therefore, with all the aforementioned, CSR can be defined as *"a concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis"* (European Commission, 2008).

According to Porter and Kramer (2006), although several firms already improved a lot the social and environmental consequences of their activities, they did not manage to become as productive as they could be. This is related to the fact that the above-mentioned activities consider business and society not as interdependent but as opponent.

Porter and Kramer (2006) emphasize the problem hidden behind the common approach to CSR. The majority of opportunities that firms could receive from CSR policies are unclear due to the fact that CSR are separated from business and strategy.

The most important aspect concerning CSR underlined by the aforementioned authors is that firms should stop looking at CSR policies as a waste of time and money but they should rather consider those activities as a useful source to achieve a competitive advantage.

The main issue concerning CSR policies is that the majority of firms decided to start taking care of it after being surprised by public responses (Hurst, 2004).

If the corporate social responsibility did not become such an important and worldwide known issue, most of the firms would have continued their policies without paying any attention on that manner. Porter and Kramer (2006) illustrates that CSR proponents underline four arguments to foster their thesis:

- Moral obligation: this relates to the fact that companies want to do the right thing in order to be an example to follow
- Sustainability: emphasis the environmental stewardship. Concerning this aspect, in the 1980s Norwegian Prime Minister Gro Harlem Brundtland developed the following definition of sustainability: *"Meeting the needs of the present without compromising the ability of future generation to meet their own needs"*
- License to operate: it is fundamental for firms to receive an official permission from governments to start up a new business
- Reputation: a manner that firms decide to use to improve their image

Porter and Kramer (2006) underline that the principle of sustainability appeals to enlightened self-interest, often invoking the so-called triple bottom line of economic, social, and environmental performance.

Furthermore, it is important to mention that there is a high risk of failure for firms that do not take into account the fact that social standards and science progress everyday. They cannot focus their attention only on the core social impacts of today. They need to evolve over time.

As pointed out by Porter and Kramer (2006), a fundamental part of this context is represented by social conditions. It is very important to underline that competitive context has a great importance for both societies and companies. This is related to the fact that the community and the company can achieve important benefits thanks to a strong competitive context (Petkoski, 2003).

A very interesting point highlighted by Porter and Kramer (2006) is that *“NGOs, governments, and companies must stop thinking in terms of “corporate social responsibility” and start thinking in terms of “corporate social integration.”*

Needless to say that companies are not the only one responsible for all the world’s problem and therefore it is impossible for them to find a way how to resolve them. When a successful business applies all its resources and knowledge to solve certain kind of problems, it can have a very important impact on social good than any other institution.

To take into consideration the moral purpose of business, it is remarkable to point out Porter and Kramer’s (2006) observation. The main purpose a corporation can achieve for a society is to contribute in order to create and develop a wealthy economy. Porter and Kramer (2006) stated that MNCs positive influence on society is based on the creation of new jobs, investing capital and foster business everyday. Moreover, one of the main strengths corporations have is related to their resources and know-how: thanks to that, they can change this state of affairs in both the developed and developing world (Prahalad, 2003). It is very important to underline that CSR, as illustrated by Porter and Kramer (2006), should not be only about helping societies when something wrong happened or taking care only of what businesses have done wrong.

The above-mentioned aspects are certainly part of a positive help that CSR could provide but in addition to that, it is fundamental to realize that there is the possibility to change the mentality concerning how companies and society think about each other. This can be achieved through *“efforts to find shared value in operating practices and in the social dimensions of competitive context”*, (Porter and Kramer 2006).

### 3.2.2 Freeman (2006)

Freeman (2006) illustrates a very different notion compared to the one developed by Porter and Kramer (2006). He introduced the stakeholder theory, based on the fact that it is fundamental to promote an alternative way of doing business.

This alternative way of doing business is characterized by the integration in the same strategy of the following three features:

- Ethics
- Society
- Business

The stakeholder theory is very different from both the Porter and Kramer (2006) framework and the TCE. The core difference that there is between the stakeholder theory and the framework developed by Porter and Kramer (2006) is that in the latter framework, firms did not manage to become as productive as they could be. This is related to the fact that companies consider business and society as opponent rather than interdependent (Porter and Kramer, 2006). On the opposite side, the stakeholder theory does consider business and society as two interdependent features.

Concerning TCE, as illustrated by Borgatti and Foster (2003), this is characterized *“by reasserting the primacy of economic performance as a driver of exchange behavior”*.

Therefore, it is possible to notice that it is different from the stakeholder theory since Freeman’s theory (2006) does not consider the economic performance as the core driver of exchange behavior. Freeman (2006) pointed out that if everyone keeps thinking of business and social responsibility as two unconnected things, unintentionally promote the idea that they involve discrete thought processes and activities.

It is very important to highlight the fact that the stakeholder theory is based on the assumptions that value represents a fundamental aspect to be taken into consideration while doing business (International Institution for Sustainable Development, 1992).

As pointed out by Freeman (2004), the above-mentioned theory requests managers to take care of the following issues:

- To clearly define the value they are able to generate
- To provide a clear explanation on how managers decide to do business

- To point out what kind of interactions managers agree to have towards their stakeholders (Freeman, 2006)

One of the most significant features illustrated by the stakeholder theory is that there is a high need for managers to take into deep consideration the interests of those people who could have an important influence on their activities. This has to be taken into consideration independently from what the main purpose of the MNC is. The stakeholder theory can be easily related to the concept of corporate social responsibility. This has been illustrated by Carroll (1999), who highlighted that *“there is a natural fit between the idea of corporate social responsibility and an organization’s stakeholder”* (Carroll, 1999). The above-mentioned author suggested that the stakeholder concept developed by Freeman in 1984, *“personalizes social and societal responsibilities by delineating the specific groups business should consider in its CSR activities. Thus, the stakeholder nomenclature puts names and faces on the societal groups who are the most important to business”* (Carroll, 1999).

### 3.2.3 Levy and Kolk (2002)

Concerning the legal aspect, as underlined by Petkoski (2003) it is very important to underline the fact that some firms decide to go international due to legal restrictions present in their home countries. These restrictions can be related to different fields. Some regulations are general while others are related to specific issues such as for example CO<sub>2</sub> emission. Due to the fact that CO<sub>2</sub> emission regulations are not as strict in developing countries as in the developed one, several firms take the decision to move their production in emerging countries (Bosetti and Victor, 2011). By doing so, they do not have to care about their internal restrictive regulation anymore.

Furthermore, the legal aspect has to do with the amount of time needed to start up a new business in certain countries. There are some countries in which in few weeks, a company can begin its new business without any kind of problems and without having to wait too long. While in other countries, due to their local regulation, it always takes a lot of time to start up a new activity. Most of the time, companies that have to wait too long to begin their activities in new countries take the decision to open their new business somewhere else.

After explaining in the previous chapters the different reasons for MNCs to get involved into actions to combat climate change, Levy and Kolk (2002) provide a concrete example by illustrating the different reasons that push oil companies to combat climate change.

These different ways of acting were related to regulatory expectations, norms concerning the conduct of business-government relations and cognitive assumptions regarding the future of fossil fuels (Levy and Kolk, 2002). Therefore, all these diverse regulation represent concrete examples of legal aspects that differ between countries and that can hence foster firms to go international due to the legal restrictions present in their home countries.

Figure 1 attached below shows the different response on climate change taken by oil MNCs.

Levy and Kolk (2002) pointed out that there are different environmental strategies that a firm can follow:

- Firms can decide to do not do anything to protect the environment
- Firms can play a passive role of submission
- Firms can choose to get involved into a proactive and effective operations to truly help the environment (Levy and Kolk, 2002)

The two authors adopted Gladwin and Walter's (1980) two-dimensional typology.

They decided to use this typology because *“it is richer in its portrayal of strategic options, though we use labels for each quadrant that are more self-evident and accord with terminology in recent literature”* Levy, Kolk (2002).

Four competing oil companies are represented in the figure below: two American firms (Exxon and Texaco) and two European (BP and Shell). To better understand the figure below, it is fundamental to explain the meaning of the word “cooperative” in the climate change context. According to Levy and Kolk (2002), based on Gladwin and Walter (1980) figure, cooperative means, *“support for mandatory emissions controls and investment in renewable energy technologies”*. As explained by Levy and Kolk (2002), the second dimension refers *“to the degree of assertiveness with which a company supports or opposes regulatory efforts”*.

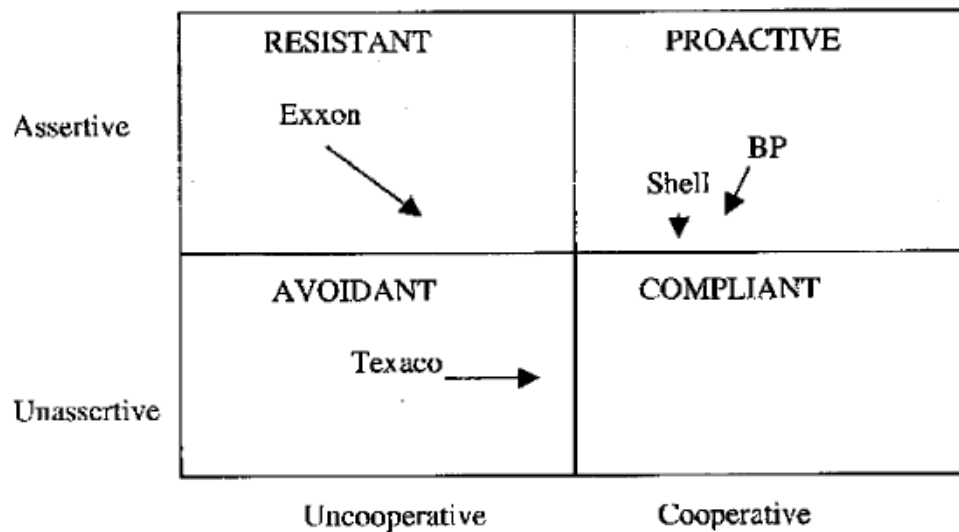


FIGURE 1. Responses to climate change.  
 Derived from Gladwin and Walter (1980). Positions as of 1998; arrows indicate subsequent movement.

**Figure 1: Responses to climate change. Source: Gladwin and Walter, 1980.**

The main differences that there are between the aforementioned European and American oil companies are related to the fact that the former companies decided to keep their core focus on oil and gas businesses. As pointed out by Levy and Kolk (2002), the focus of BP is on renewables energies. The two authors point out that although the European companies could still be considered proactive, there has been a movement toward the center. The arrows present in the figure illustrate the movements towards the center. While all companies have moved their position, overall the convergent trend has been toward the European position (Levy and Kolk 2002).

Oil MNCs are very sensitive to external threats such as green house gases controls. Gladwin and Walter (1980) argued that *“security of supply and stability in demand were the 'Jugular veins' of the oil industry and any threat would likely trigger an assertive, uncooperative response, labeled 'resistant' here”*.

To finalize this chapter, it is possible to state that MNCs that decided to get involved into actions to combat climate change have to face several competing pressures since they are active in different institutional contexts.

Therefore, as illustrated by Levy and Kolk (2002), the dissimilar reactions that European and U.S. oil companies had at the beginning of the climate change issue were related to regulatory

expectations, norms concerning the conduct of business-government relations and cognitive assumptions regarding the future of fossil fuels. All of the above-mentioned influences were related to the company's own history and the institutional context of each of them.

It is remarkable to mention that the companies with already experience in renewable technologies were the most discreet in investing in renewables energies to tackle the climate change issue.

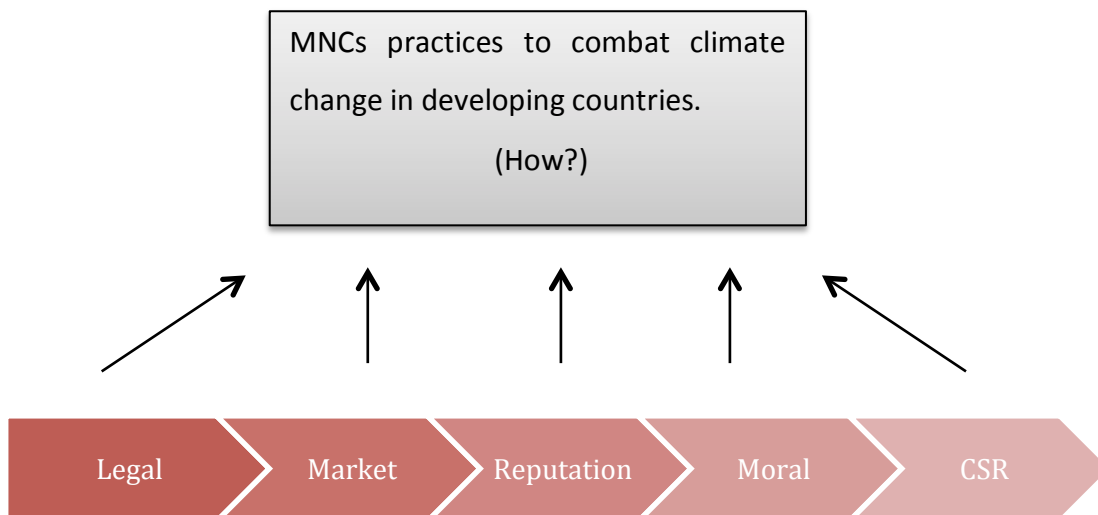
The observations and personal ideas that managers have in terms of markets, technologies, and regulatory prospects appeared more important as strategic drivers than any objective assessment of these factors. This is due to the fact that managers always try to analyze all the possible costs and benefits for every single strategy they develop (International Institute for Sustainable Development, 1992). Beside that, it is important to mention that all these calculations are based on forecasts shaped by interactions with competitors, governments, the media and other institutions (Levy and Kolk 2002).

To sum up, it is possible to state that the theory chapter took into consideration different authors, such as Hansen (2003), Porter & Kramer (2006), Freeman (2006) and Levy & Kolk (2002) to present all the different reasons that push firms to get involved into actions to combat climate change in developing countries. Therefore, it has been found that there are different aspects that foster firms to start taking care of the climate change issue in developing countries. At the end of this chapter, it has been presented additionally an example based on MNCs different responses to climate change.

## 4.0 Analytical framework

This section illustrates the analytical framework implemented in my project.

The core point of this chapter is to illustrate the dependent variable, which it has been depicted in the scheme insert below.



**Table 4: Analytical framework**

The dependent variable is the following: MNCs practices to combat climate change in developing countries.

This dependent variable is based on the distinction that there is between different kinds of activities MNCs are taking against climate change in developing countries.

These activities are the following:

- Strategy/ Policies
- Organization and procedures
- Outreach/ Communication
- Projects

It is very important to underline that there are different exploratory variables to explain the reasons why firms decide to tackle the climate change issue in developing countries.

The framework presented above underlines some of the main reasons why firms decide to tackle the climate change issue in developing countries. Related to this aspect, it is significant to clarify that different authors have different approaches. Some authors are for a political point of view, other more focused on business or CSR.

In light of what stated in the framework presented above, it is not possible to state that is present a unique reason that push firms to get engaged into activities to combat climate change in developing countries but it may be considered as a continuum spanning of actions undertaken from legal purposes to CSR commitments. In the middle of this continuum, market, reputation and moral reasons can be encountered.

## 5.0 Climate change activities in MNCs

The objective of this chapter is to analyze the different manner through which MNCs tackle the climate change issue. Firstly, it has been presented that changes in the climate change do have a significant impact on how businesses operate (UNFCCC, 2007).

Furthermore, concerning how companies tackle climate change, the core difference analyzed has been the one between product focus firm and process focus firm.

A list of companies that have been involved in the creation of both products and processes against climate change will be presented, highlighting how their strategies are implemented and pointing out projects realized by MNCs in developing countries to tackle the climate change issue.

The final part presents two tables that sum up what are the main internal and external factors that push firms to combat the climate change issue in developing countries.

In addition to that, the results obtained from the interview conducted with the Novozymes sustainability manager Claus Frier have been presented.

To be able to overcome the climate change challenge reducing greenhouse gas (GHG) emissions, business can represent a useful tool to develop alternative way to develop innovative technology but it is not the only factor that needs to be taken into consideration in order to eradicate the climate change issue. It is fundamental to have collaboration with governments, local authorities, and civil society. With increasing populations and changing life styles in developing countries, CO<sub>2</sub> emissions are likely to rise further (UNFCCC, 2007).

The main objective of the World Business Council for Sustainable Development (WBCSD) is to make people, firms, governments and organizations aware of the fact that there is the possibility for firms to tackle the climate change issue through the development of eco-efficient and cost-effective solutions.

The WBCSD 2009 report underlines that in the next decades, to population growth will correspond a growing global demand for essential life products such as food, water and energy.

A very significant aspect on which it is fundamental to focus on is that there will be an increase competition for the above-mentioned resources due to climate change.

To reduce greenhouse gas emissions, it is important to make a more sustainable use of the land. Tree should be planted on a regular basis and forests should be managed to reduce the GHG, especially carbon dioxide (CO<sub>2</sub>) in the atmosphere (Urban Land Institute, 2010).

As argued by the WBCSD report (2009), *“the main challenge is to shift land use from a major global source of emissions to a major sink, through such activities as improving sequestration potentials, sustainable landscape planning and restoring degraded lands”*.

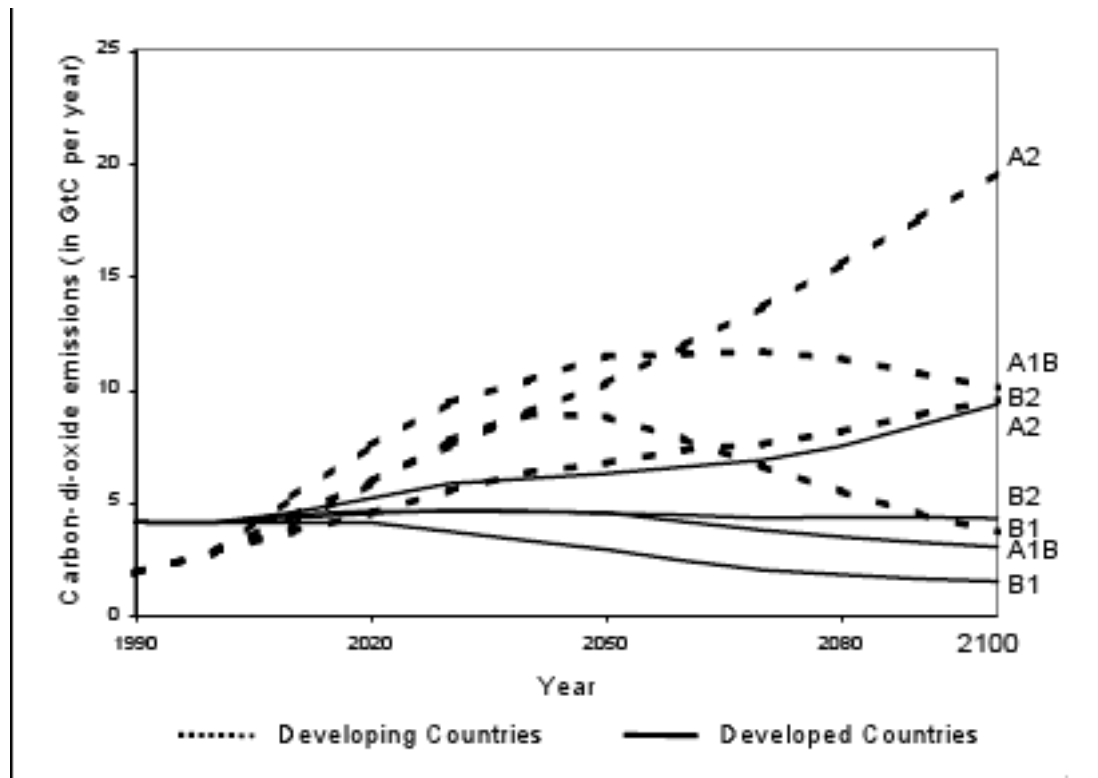
As mentioned above, nowadays there is a high request for firms to develop technologies to combat climate change and to be more sustainable.

To achieve that purpose, developing countries need to obtain new technologies but the main issue is represented by the fact that most of the time, those countries have barriers to overcome in order to have access to IP for new technologies (Hasper, 2009). It is very important to underline that developing countries' emissions represent a real danger for climate change.

Heller and Shukla (2003) pointed out that *“the total emissions from developing countries will continue to rise sharply and they are projected to surpass those of the developed countries within a decade or two”* (figure 2). *“Most plausible emission scenarios suggest that developing country emissions must fall below business-as-usual projections if atmospheric greenhouse gas concentrations are to be stabilized by 2100”* (Heller and Shukla, 2003).

The main reason related to the rapid rise of emissions in developing countries is related to their need for both energy and economic growth (Twas, 2008). These countries are becoming more and more industrialized and therefore all the actions taken to develop as soon as possible influence the environment in a negative manner.

This aspect has to be taken into consideration in the next climate strategies if they want to be constructively and seriously engaged in common responsibilities for climate protection.



**Figure 2: Projected CO<sub>2</sub> emissions for developed and developing countries.** *Source: Heller and Shukla (2003)*

Some developing countries have already started some operations to combat climate change.

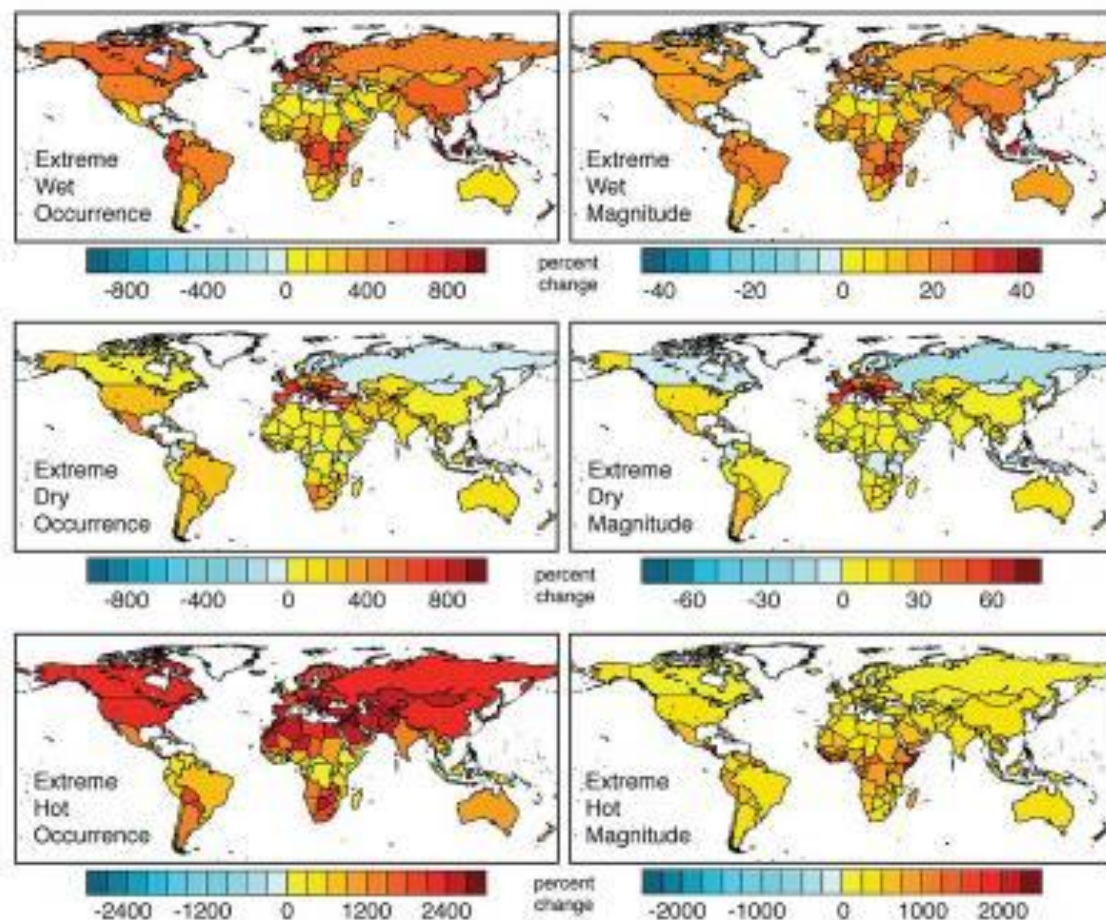
Heller and Shukla (2003) highlight that there has been a decrease in the Chinese greenhouse gas emissions thanks to China's rapid improvements in energy efficiency. The same trend has been followed by other developing countries.

Nevertheless, it is remarkable to take into consideration that *"since constraining economic growth is not an option for policy makers, the only politically viable approach to climate issues is to devise development strategies that can produce climate benefits ancillary to sustained economic expansion"* (Heller and Shukla 2003).

What the two authors want to underline is that at the present time there is an urgent need to start considering climate change as an issue to be tackle at the current stage, without waiting further years. Developing countries should foster policies to combat climate change in order to attract MNCs to start new climate change projects on their lands (Wen, 2009).

In addition to what stated above, climate change has a very negative influence especially on developing countries due to the fact that it affects seriously the whole agricultural segment.

Due to the high dependency of developing countries on agriculture, the increase number of natural disaster related to climate change will certainly affect in a very negative manner agricultural productivity. The following maps, realized by a team of the American Purdue University (2009), illustrate changes that will take place due to extreme climate conditions:



**Figure 3. Worldwide variations due to climate change. Source: Diffenbaugh Lab Image, (2009)**

Through their analysis, the researcher found that *“the occurrence and magnitude of what are currently the 30-year-maximum values for wet, dry and hot extremes are projected to substantially increase for much of the world”* (Diffenbaugh, 2009).

Needless to say that the main reason why these extreme conditions will occur more frequently is related to climate change.

To create these maps, the team of researchers of Purdue University took into consideration different data. They started using data from the last decades of the last century and they created different projections for the end of the 21<sup>st</sup> century. Through a deep analysis of those data, the team of researchers has been able to grow a framework related to different extreme climate conditions and how these extreme conditions influence the number of impoverished people in each country.

From the maps above, it is possible to notice that the extreme weather conditions in the first place will hit developing countries mainly in Africa and Asia.

Taking into consideration the extreme hot occurrence, the related map shows that there will be an important increase in the temperature especially in the northern part of the hemisphere.

In order to have a clearer overview on how much future climate extremes will increase the number of poor people all over the world, it is significant to analyze what stated by Hertel (2009), executive director of Purdue's Center for Global Trade Analysis.

He pointed out that *"Bangladesh, Mexico and Zambia showed the greatest percentage of the population entering poverty in the wake of extreme drought, with an additional 1.4 percent, 1.8 percent and 4.6 percent of their populations being impoverished by future climate extremes"* (Hertel, 2009).

With the data illustrated in those maps, the associate professor of earth and atmospheric sciences Noah Diffenbaugh (2009) wanted to depict that *"this is an initial quantification of how poverty is tied to climate fluctuations"*.

In addition to what mentioned above, the studies conducted by the Purdue's University researchers illustrate that the highest increase concerning extreme wet magnitude will take place in Southeast Asia. The peak of extreme hot magnitude will be in Central Africa while the place that will be hit by the most extreme drought will be the Mediterranean.

All the future predictions related to extreme climate conditions have been compared to historical agricultural productivity extremes. This has been done to be able to assess the prospective impact on agricultural production, prices and incomes.

In light of the above, it is clear that there is a urgent need for firms to start taking action to combat climate change and in order to provide more information related to what companies decide to do to tackle this issue, it is important to analyze what Cogan (2006) presented.

He pointed out different points that a company should follow to combat climate change.

It is remarkable to state that the first step firms should take is to understand the very strict connection present between their own businesses and climate change.

In addition to that, companies need to start reducing GHG emissions and developing new sustainable strategies to mitigate the climate change risks. Firms need to take part actively in climate change dialogues in order to improve their effectiveness opportunities.

As highlighted by Cogan (2006), CEOs are the one responsible to develop and implement strategies against climate change correctly and effectively. The right way to follow in order to develop

strategies against climate change is to focus on long-term financial results and on the creation of long-standing shareholder value (Cogan, 2006).

### 5.0.1 When do firms decide to take climate change issue into consideration when doing business?

There are different reasons why MNCs decide to get involved into activities to combat climate change in developing countries. It is not possible to generalize everything and saying that MNCs are all involved in developing countries to combat the climate change issue pushed by the same purpose. Therefore, although there are different reasons, there is an unquestionable aspect to take into consideration: firms cannot afford anymore to ignore global warming.

As the years pass by, it is possible to notice that climate change represent a present and very serious issue. Glaciers are melting due to the overall global warming and other natural disasters such as hurricanes and tsunamis are taking place with a very frightening continuity.

If on the one hand all these issues represent a very high risk for companies, on the other hand companies could also achieve important opportunities.

Companies that start taking care of climate change in advance might actually prosper and profit from advantages stemming from this issue (Caring for Climate, 2007).

The UN Secretary-General Ban Ki-Moon stated in December 2007 that *“early, bold and comprehensive action to climate change is absolutely necessary. Businesses must take action to reduce their carbon footprint and to develop innovative solutions. I particularly encourage business involvement in leadership initiatives, such as Caring for Climate”*.

There has been a shift in the MNCs mentality since at the beginning of this century only few firms were already active in the fight against climate change (Briggs and Edwards, 2006).

As the years passed by, the number of firms that decided to play an active role against the above-mentioned issue increased enormously. It is clear to everyone that the question now is not when climate change will take place, but rather how fast this phenomenon will develop.

Cogan in the Ceres report (2006) points out that *“companies at the vanguard no longer question how much it will cost to reduce greenhouse gas emissions, but how much money they can make doing it. Financial markets are starting to reward companies that are moving ahead on climate change, while those lagging behind are being assigned more risk”* (Ceres report, 2006).

From what stated above it is important to underline the fact that firms started finally to consider climate change as an opportunity to increase their revenues (Kolk, 2004).

Concerning how to react to climate change, it is needless to state that if on the one hand some companies will be in a better position to tackle this issue, on the other hand there will be a lot of firms getting more exposed to climate change (Allianz Group and WWF, 2005).

Examples of governance practices, which serve as an overall model for all leading firms, are that in all the companies, it is fundamental to have boards of director starting taking care of the climate change issue and therefore understanding that they cannot postpone to tackle this imminent matter. Moreover, solutions to lower the GHG emissions need to be found.

### **5.0.2 Case studies of climate change activities in MNCs**

A significant difference between firms that create product to tackle the climate change issue and companies that develop processes can be noticed.

It is very important to point out the difference between product and process focus firms because companies arrive to develop their strategies to combat climate change focusing either on the first or on the second aspect. As already presented in the analytical framework, there are different reasons that push companies to combat climate change in developing countries.

These reasons are:

- Legal
- Market
- Reputation
- Moral
- CSR

The drivers behind different kind of activities have different scopes and content that are determined by different factors.

There are firms that, through the virtues of their products, they try to solve climate change problems. Companies can be associated to product related kind of activities because they have a strong commercial purpose behind that.

Examples of these firms are:

- Vestas
- Syngenta
- Sompo Japan

On the other hand, other companies to compensate the CO2 emissions they produce end up implementing energy programs or they decide to get involved into green activities such as for example saving forests in developing countries.

Examples of these firms are:

- Novozymes
- PepsiCo
- Unilever
- Kimberly Clark

There are different reasons to explain why I decided to focus my attention on these companies rather than on others: first of all, the above-mentioned companies have been all very engaged into sustainable activities to combat climate change during the last few years and furthermore because all of them present long-term projects to tackle the climate change issue in developing countries.

Considering firms individually, the decision to include Novozymes in my project is related to the possibility to conduct an interview with the firm's sustainable manager, Claus Frier.

The list of cases present below will be used to provide a clear and detailed understanding of how firms' projects help developing countries to combat climate change. The core purpose of the cases is therefore to explain that there are a very high number of projects and activities that could be implemented all over the world to tackle climate change.

To sum up, the main reason why I decided to focus only on few cases is because they are the most representative sample of the issues researched in this project and moreover because they are the most suitable to find an answer to the research question.

## 5.1 Product focus firms

### 5.1.0 Vestas

To better understand why and how firms decide to get involved in activities to combat climate change, I focused my attention on Vestas, world leader in wind technology. This Danish company is characterized by high performance and quality services (Vestas website, 2011)<sup>1</sup>.

Since when it started manufacturing wind turbines in 1979, Vestas can be considered as a pioneer in the wind industry (Vestas website, 2011).

In addition to the importance of the company itself, it represents a really interesting case to analyze since this company is active in some developing countries such as China and India. Concerning China, Vestas installed its first wind turbines in Shandong in 1986 (China daily website, 2011)<sup>2</sup>.

The growing importance that China has for Vestas has been underlined by the fact that this Danish company invested more than RMB 3.5 billion to improve its presence in China (Vestas, 2011). The main aim to be achieved in the Chinese market is based on the delivery of high quality wind energy solutions to foster the implementation of sustainable and innovative energies instead of the traditional one.

Vestas considers China as a fundamental region ready to achieve a further step on its development and therefore Vestas needs to have a strong and efficient presence in there.

As illustrated by the Vestas website<sup>3</sup> (2010), on the 12<sup>th</sup> of October 2010 Vestas opened its China Technology R&D Centre. This represents the first dedicated wind energy R&D center set up by an international player in China. The importance of this opening is related to the fact that Vestas wants to export and install the best of its knowledge in China.

Jens Tommerup (2010), President of Vestas China, pointed out that *“the opening of the Vestas Technology R&D Centre China supports the Chinese government’s vision of China evolving from manufacturing to innovation, and is a natural step in Vestas’ development”*.

In addition to that, Jens Tommerup (2010) explained why China is so important:

*“China has a unique environment by virtue of its nature and geography, its rapid economic growth and ambitious wind energy policies Vestas China Technology R&D Centre represents our intention to bring the best of our knowledge to China and is a major step in Vestas’ continuous commitment to its development”*.

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<sup>1</sup> <http://www.vestas.com/>

<sup>2</sup> [http://www.chinadaily.com.cn/china/2011-06/20/content\\_12738938.htm](http://www.chinadaily.com.cn/china/2011-06/20/content_12738938.htm)

<sup>3</sup> <http://www.vestas.com/en/media/news/news-display.aspx?action=3&NewsID=2412>

All the reasons foreseen explain why Vestas decided to play an active role in China, especially because this Danish company is sincerely involved in the creation of innovative and sustainable energy to support the global fight against climate change.

As stated by the Vestas website<sup>4</sup> (2011), there has been a reduction of CO<sub>2</sub> emissions by more than 40 millions tons per year thanks to the wind power delivered by Vestas.

Thanks to the entire different field Vestas decided to get involved in China, a significant reduction of energy costs will take place.

As illustrated by the Vestas website<sup>5</sup> (2008), on the 17<sup>th</sup> of December 2008, the European Parliament accepted the decision of the EU Heads of State on the ambitious EU climate and energy package. This package contains two EU Directives very significant for wind power:

- The Directive on Renewable Energy (RE)
- The Directive on the European Emission Trading Scheme (Vestas website, 2011)

Vestas' president and CEO, Ditlev Engel, welcomed the adoption of this EU package regarding clean energy and climate, underlining how much important this agreement was.

The above mentioned climate package includes the following restrictions:

- 20 per cent emissions reduction target
- 20 per cent renewable energy target
- 20 per cent energy efficiency target by 2020

These targets need to be achieved in order to foster the development of sustainable and renewable energy sources to combat climate change. The wind energy represents a very good example of efficient renewable energy and therefore the RE directive offers the stability that this industry needs for a continuous development (Vestas website, 2010).

Needless to say that through the adoption of this directive, the EU highlights that the wind power will be considered as the conventional clean electricity provider.

Moreover, a positive effect related to these EU directives is the creation of a price of carbon. By doing so, this will incentivize investment in sustainable energy sources (European Renewable Energy Council, 2008).

The commitment of Vestas in the field of the renewable energy has been awarded on the 19<sup>th</sup> of January 2011. As posted on Vestas website<sup>6</sup> (2011), this Danish company won the world's most

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<sup>4</sup> <http://www.vestas.com/>

<sup>5</sup> [http://www.vestas.com/files//Filer/EN/Press\\_releases/VWS/2008/081217-PMUK-10.pdf](http://www.vestas.com/files//Filer/EN/Press_releases/VWS/2008/081217-PMUK-10.pdf)

<sup>6</sup> <http://www.vestas.com/Default.aspx?ID=10332&NewsID=2553&action=3>

prestigious award in the field of renewable energy thanks to its innovative and efficient projects developed in that field. The prize received by Vestas has been 1.5 million US dollars. These money have been invested in further projects to keep improve the development of renewable energy. The importance of this award is underlined by the fact that 391 between companies and organizations from 69 countries participated in this contest.

The former Nobel Peace Prize laureate and chairman of the UN Intergovernmental Panel on Climate Change (IPCC) Dr. RK Pachauri (2011), described Vestas as *"fully meeting the three criteria of the prize - innovation, leadership and a long term vision."*

Moreover, he explained that: *"for over 30 years, Vestas turbines have been among the most innovative in the world across the industry. Not only has the company - almost single-handedly - been a pioneer in the wind power industry, it simultaneously succeeded in spite of the fact that they are established in a small country."* Despite of all the obstacles Vestas encountered on its path, it has been able to become the world leader in renewable energy.

The fact that wind power and the development of sustainable and renewable energies represents the core focus of attention for Vestas has been stressed by Vestas' president and CEO, Ditlev Engel (2011): *"We only have one thing on our minds – and that is wind,"* said Engel, *"to continuously develop the technology in order to make wind energy as cheap as possible for both our customers and end users worldwide".*

Vestas strong and influential presence in China has been underlined as well by the invite the Danish company received to participate in a meeting with the Chinese Premier Wen and the EU president Barroso. Vestas has been called to participate as representatives of leading European businesses in China (Vestas website, 2011).

Furthermore, to show how important is to have a good relation and connection with the Chinese government, it has been pointed out by Jens Tommerup (2011), president of Vestas China: *"It is very important to have a sincere high-level dialogue between businesses and the highest level of the Chinese government, and we appreciate this opportunity. We hope that this can be the first step in a continuing discussion about the future development of the wind energy sector in China".*

The support of the Chinese government has been fundamental to enhance the growth of the wind energy industry. In fact, China is nowadays the most dynamic wind energy market, ready to start the path of the development of new sustainable energy sources.

### 5.1.1 Syngenta

After Vestas, the other product focus firm I analyze is the Swiss agribusiness company Syngenta. This company is involved in biotechnology and genomic research. The WBCSD (2009) represented the alternative way created by Syngenta of making sugar. Thanks to the alternative method developed by this Swiss company, sugar can be either used for food or converted into biofuel. As stated in the WBCSD report (2009), the Swiss company achieved this by creating a new variety of sugar beet that has a range of positive consequences.

The above-mentioned report presents Syngenta innovative product, the tropical sugar beet. The core characteristic that differentiates this kind of beet from the other varieties is that it can be used both as a source of sustainable sugar and ethanol production (WBCSD report, 2009).

The innovative feature of this product resides in the fact that it can be grown both in subtropical and tropical areas. The positive advantages are related to the creation of new opportunities for farmers and increases production in bordering areas where the effects of climate change are very severe (Syngenta website, 2011)<sup>7</sup>.

In 2008 Syngenta received the World Business and Development Award for the beet's role (Syngenta website, 2011). This Swiss company obtained the aforementioned award thanks to its active help to achieve the United Nations Millennium Development Goals.

Some of the main advantages that can be provided by the usage of the tropical sugar beet are related to the possibility of cultivating the beet in countries present in both hemispheres and to the fact that the water consumption of this beet is not as high as the one needed by other beet's varieties (Syngenta annual report, 2008)<sup>8</sup>.

During the last decade, this Swiss company has been able to conduct successful trials in several developing countries such as Brazil, China, Colombia, Egypt, India, Kenya, Mexico, Pakistan, Peru, South Africa, Sudan, Thailand and Vietnam (Syngenta website, 2011).

One of the most significant things Syngenta did in these developing countries is that, instead of creating only new jobs, it offered training for local farmers in order to become familiar with the Syngenta techniques.

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<sup>7</sup> <http://www.syngenta.com/global/corporate/en/about-syngenta/Pages/company-history.aspx>

<sup>8</sup> <http://annualreport2008.syngenta.com/>

### 5.1.2 Sompo Japan

There are companies that are developing tools to measure their impact on climate change in order to help decision-making. One of these is Sompo Japan.

This insurance company is characterized by the fact that it provides the opportunity to insure yourself against changing climatic conditions (Sompo Japan website, 2011)<sup>9</sup>.

During the last few years, there has been an increase in the number of natural catastrophes such as floods, droughts, hurricanes and typhoons. The main reasons why all these disasters are taking place more regularly nowadays are due to climate change.

There is an urgent need to develop measures to protect against these natural calamities. Especially developing countries need these kinds of measures more urgently than the other countries.

In order to build up these measures against climate change, important financial resources are needed. Public funding will not be sufficient and therefore it is fundamental for these countries to receive private funding (Sompo Japan website, 2011)<sup>10</sup>.

The weather index developed by Sompo Japan works in the following way: if certain weather conditions such as an increase of temperature and frequent precipitations occur against indexes for the above-mentioned phenomenon, the Sompo weather index would pay a pre-stimulated amount of money (Sompo Japan website, 2011).

The core advantage of this index is that it provides instant reimbursement for the loss of profits. The main target is the agricultural sector in South-East Asia, where weather-related risk is difficult for local farmers to handle. To be more specific, the WBCSD report (2009) illustrates that Sompo Japan is mainly focusing its attention in the Knon Kaen province in Thailand.

The main reason why Sompo decided to focus its attention on this province is related to the fact that the province is extremely dependent on rainfall due to its water scarcity (Sompo Japan annual report, 2009)<sup>11</sup>. Needless to say that the sector this issue influence the most is agriculture, which represents the main source of profits for the above-mentioned province.

A further reason why Sompo Japan decided to focus its attention on that specific Thai province is because that province has the most precise meteorological weather forecasts compared to the other regions present in the northeast area of Thailand (WBCSD report, 2009). It is important to underline as well that local farmers are not familiar with insurance features and therefore they have difficulties in paying back the loans that Sompo Japan lend them to buy agricultural equipment. To overcome this issue, the WBCSD report (2009) illustrated that the Japanese insurance company

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<sup>9</sup> <http://www.sompo-japan.co.jp/english/>

<sup>10</sup> <http://www.sompo-japan.co.jp/english/>

<sup>11</sup> [http://nksj-hd.com/ir/data/annual/backpdf/sompo/2009/SOMPO09\\_all.pdf](http://nksj-hd.com/ir/data/annual/backpdf/sompo/2009/SOMPO09_all.pdf)

together with the Thailand's Bank for Agriculture and Agricultural Cooperatives (BAAC) developed a new method to sell an insurance product.

This Japanese insurance company is truly involved in this project because it trusts that its product development capabilities and know-how are the right tool to stabilize both Thailand's economy and agriculture (Sompo Japan website, 2011).

Its core objective is to expand the technique used in Thailand in other several Asian developing countries to combat climate change.

The main advantages that private sector has towards public funding, in terms of risk financing methods, is related to its effectiveness adaptation measure thanks to the fact that the methods implemented are more flexible and mobile. In addition to that, it is fundamental to have efficient risk transference to capital markets in order to ensure the capacity to cover the risk.

This is the further step that the Japanese insurance company has pledged to be involved in to continue its activities to combat the climate change issue worldwide.

The table below depicts what are the cores internal and external strategies and initiatives developed by the above-mentioned companies:

	<b>Internal</b>	<b>External</b>
<b>Vestas</b>	Core initiative: creation of clean energy to support the global fight against climate change	Great connection with host countries authorities and governments (China, India)
<b>Syngenta</b>	Core initiative: make sugar that can then be used for food or converted into biofuel	Training programs for local farmers to become familiar with the firms' techniques
<b>Sompo Japan</b>	Its weather index provides instant reimbursement for the loss of profits	Focus on South-east Asia where weather-related risk is difficult for local farmers to handle

**Table 5: Internal and External Strategies for product focus firms**

## 5.2 Process focus firms

This section provides examples of how companies have changed their practices to help tackle climate change. Therefore, the attention now is based on process focus firms.

### 5.2.0 PepsiCo

The first firm process focus that I decided to analyze is the American firm PepsiCo. In order to become more and more sustainable, this company decided to focus on water conservation and methane emissions reduction in rice paddies (PepsiCo India website, 2011)<sup>12</sup>.

As illustrated by the WBCSD Report (2009), PepsiCo started a sustainable project in India.

The main reason why PepsiCo decided to start its project in India is because this Asian country is among the largest rice growers in the world. There are important differences between the traditional way through which rice is cultivated in India and the innovative operations this American company decided to apply.

Normally, as presented by the WBCSD Report (2009), *“paddy is cultivated by sowing seeds in a small nursery, where the seeds germinate into saplings”*.

All the projects developed by PepsiCo in India started in 2004 when this American company decided to conduct some experiments through the direct seeding of rice in its R&D fields. When PepsiCo realized that its trials were successful, it decided to teach this new process to local farmers. The results have been notable (PepsiCo India website, 2011).

Thanks to this new technique, PepsiCo has been able to conserve over 5 billion liters of water, as illustrated by the WBCSD Report (2009). Moreover, this new method implemented by the above-mentioned American firm has another very important and positive effect because it consents a reduction of methane emissions thanks to the fact that the innovative method does not require the use of water at the base of the crop (PepsiCo India website, 2011). These emissions were normally extremely high in India and they represented a big challenge. The high percentage of methane emissions was caused by the traditional cultivation through flooded irrigation.

The deep involvement of PepsiCo in India is underlined also by its partnering with the Indian Agricultural Research Institute (IARI). The main aim of this partnership is to conduct trials to

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<sup>12</sup> <http://pepsicoindia.co.in/>

analyze the different impact that direct and traditional seeding rice have on global warming, GHG emissions and other climate issues (PepsiCo annual report, 2010)<sup>13</sup>.

This new technique developed by PepsiCo represents a very important tool to combat global warming. In fact, the WBCSD Report (2009) illustrated that a report issued by the Indian Agricultural Research Institute (IARI) shows a 75% reduction in global warming potential through the new system developed by PepsiCo.

The next step this American firm wants to take is to cooperate with the United Nations Framework Convention on Climate Change (UNFCCC) in order to have direct seeding of paddy included as an approved means to earn carbon credits (PepsiCo annual report, 2010).

This cooperation will have an important influence on the PepsiCo project because, if approved, this firm will consolidate carbon credits for all the fields in which they adopted the direct seeding method. Besides that, PepsiCo will teach the local farmer how to use its technique. This American firm is used to work with local farmers since it started doing that during the last decade of the past century.

The main reason why the relationship between PepsiCo and local farmers work is related to the company's policy. The WBCSD Report (2009) explains that the firm policy of first testing a new technology completely and only afterwards expanding the farmer base gradually makes the farmers confident in regards to this innovative approach. This represent a very successful story because most of the times MNCs struggle on how to teach and train local farmers to follow the innovative techniques. Since the Indian farmers saw the positive effects that this new technique achieved during the last years, they decided to keep on using it (PepsiCo India website, 2011)<sup>14</sup>.

### 5.2.1 Unilever

Unilever is a British-Dutch company that has been involved already for several years in project spread all around the world based on impact reduction, adaptation to local climatic conditions and GHG emissions reduction (Unilever website, 2011)<sup>15</sup>.

As presented by the WBCSD Report (2009), already twenty years ago Unilever Tea-growing farms in East Africa (UTEA) was focusing its attention on the fact that deforestation around Lake Victoria and the Mau Forest in Kenya represented a real and concrete threat to business in that area.

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<sup>13</sup> [http://www.pepsico.com/Download/PepsiCo\\_Annual\\_Report\\_2010\\_Full\\_Annual\\_Report.pdf](http://www.pepsico.com/Download/PepsiCo_Annual_Report_2010_Full_Annual_Report.pdf)

<sup>14</sup> <http://pepsicoindia.co.in/>

<sup>15</sup> <http://www.unilever.com/>

This can be explained by pointing out that forests play a vital role on local water cycles. Because of the forest shrinking, rainfall patterns modified and this led to longer dry seasons.

Needless to say that having more frequent and longer dry seasons does have a negative impact on the local economy. The WBCSD Report (2009) illustrates the impact of Unilever in Tanzania.

The duration of the dry season in this country is approximately of six months and therefore it is fundamental to develop an alternative way through which reach economic sustainability.

The most effective one is based on tea irrigation. Unilever played an active role in enhancing the irrigation system, in order to minimize the waste of water and besides that it took care of the high biodiversity value forest presents in the specific area in which Unilever developed its projects (Unilever annual report, 2010)<sup>16</sup>.

This British-Dutch company created a system to recycle and store the rainwater, in order to use it to irrigate fields. Thanks to this method, the company has been able to save a lot of liters of water (Unilever annual report, 2010).

To present a more detailed case, the WBCSD Report (2009) depicted that in Kenya, UTEA developed a program to identify and breed drought-tolerant tea varieties. Unilever investment of € 156,000 per year (WBCSD report, 2009) in this program illustrates how much this firm is keen on develop new sustainable projects. In addition to what stated above, this British-Dutch company decided to create a tree-planting project (Unilever website, 2011)<sup>17</sup>. The main purpose of this project is to combat deforestation in Kenya and it is possible to state that it is been a real success since several trees had been planted both on-farm and in the surrounding community (Unilever website, 2011).

To sum up, Unilever is involved in several projects to combat climate change, water scarcity and other environmental problems in Africa, especially in regions characterized by poverty, low economic growth and weak governments. The main objectives that drive this company to start getting actively involved in sustainable projects are the reduction of the aforementioned problems and the adaptation to the future climate challenges (Unilever annual report, 2010).

### 5.2.2 Kimberly-Clark

Kimberly Clark is an American corporation that produces mostly paper based consumer products. This company is truly involved in sustainable projects. In 2007, it launched the “Sustainable

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<sup>16</sup> [http://www.unilever.com/images/ir\\_annual\\_report\\_2010\\_tcm13-260379.pdf](http://www.unilever.com/images/ir_annual_report_2010_tcm13-260379.pdf)

<sup>17</sup> <http://www.unilever.com/sustainability/casestudies/Biodiversity/KenyaTeaplantationbiodiversityinitiatives.aspx>

Production and Biodiversity Conservation in Forest Mosaics Initiative” (Sustainability Project Mosaic, 2007)<sup>18</sup>, together with Conservation International and the “Instituto BioAtlantica”. The main aim of the initiative was to foster the creation of more environmentally friendly techniques in the paper industry.

Although the project started in Brazil and obtained the biggest success particularly in the Bahia and Espirito Santo regions (Kimberly-Clark annual report, 2009)<sup>19</sup>, the American company does not aim to implement that project exclusively in that country. The long-term objective of this American company is to expand the same project typology firstly to the rest of the Atlantic forest and thereafter in all the other worldwide regions characterized by plantation forests with a large landscape footprint (WBCSD Report 2009). The core objectives of the project were a reduction of CO<sub>2</sub> and the protection of coastal ecosystems (Sustainability Project Mosaic, 2007)<sup>20</sup>. All the partners who signed the contract are working together in order to create sustainable initiatives in the forest landscape. It is important to underline that the sustainable project developed by the above mentioned firms has several positive effects: on the one hand it helps the conservation of the natural resources and forests and on the other hand the mosaic strategy foster productive activities that generate employment and income. As underlined by the WBCSD Report (2009), Kimberly-Clark is conscious that plantation forests can represent a key piece of sustainable forest mosaics.

This is due to the fact that when well managed, plantations provide several positive effects, such as the protection of watercourses. Besides that, plantation provides also the possibility to store carbon reserves. A further very positive aspect related to plantations is that they offer an employment to local communities (Sustainability Project Mosaic, 2007).

### 5.2.3 Novozymes

The last process focus company I decided to take into consideration is Novozymes. Novozymes’ activities are divided into three different businesses (Novozyymes website, 2011)<sup>21</sup>:

- Industrial enzymes
- Microorganisms
- Biopharmaceutical ingredients

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<sup>18</sup> [http://www.conservation.org/sites/celb/Documents/Forest\\_Mosaic\\_Sheets\\_English.pdf](http://www.conservation.org/sites/celb/Documents/Forest_Mosaic_Sheets_English.pdf)

<sup>19</sup> [http://www.cms.kimberlyclark.com/umbracoimages/UmbracoFileMedia/2009%20Annual%20Report\\_umbracoFile.pdf](http://www.cms.kimberlyclark.com/umbracoimages/UmbracoFileMedia/2009%20Annual%20Report_umbracoFile.pdf)

<sup>20</sup> [http://www.conservation.org/sites/celb/Documents/Forest\\_Mosaic\\_Sheets\\_English.pdf](http://www.conservation.org/sites/celb/Documents/Forest_Mosaic_Sheets_English.pdf)

<sup>21</sup> <http://www.novozymes.com/en/Pages/default.aspx>

Their biological solutions help companies make more from less, thanks to the fact that their solutions save energy, raw materials, and reduce waste. The result is higher quality, lower costs, lower CO<sub>2</sub> emissions, and a better environment (Novozymes annual report, 2010)<sup>22</sup>. This firm wants to bring greenhouse gas emissions under control.

From the interview conducted on the 11<sup>th</sup> of April 2011 with Claus Frier, Novozymes sustainability manager, it has been highlighted that Novozymes process to become a sustainable firm started long time ago since the company always had a set of specific values, focusing on trying to do business in an honest way. During the 70s and the 80s the debate on genetic engineering has been very hard and Novozymes decided to base most of its research, development and production on genetic engineering and genetically modified microorganisms.

Novozymes had to build trust with stakeholders; it had to convince authorities as well as mayor green NGOs that they were able to use genetic engineering in a responsible way.

After all what mentioned above, it is possible to state that Novozymes started to take care of sustainable business in the early 90s, when CSR began to become a very important issue for firms to look at. Novozymes became a member of the World Business Council for Sustainable Development (WBCSD) in the early 90s and they did their first environmental report in 1993.

Few years later, in 1998, Novozymes made its first social impact report and sustainability report after that. Concerning climate change action in developing countries, Novozymes does not focus properly on those countries but it did develop a strategy to tackle climate change.

This strategy has three focus areas:

- Reduce its own emissions from its own factories and from its power suppliers
- Reduce emissions in Novozymes' supply chain
- Reduce their carbon footprint due to Novozymes' customers application of Novozymes' products

Novozymes' target is to enable a reduction of 75 millions tons of CO<sub>2</sub> in 2015 due to Novozymes' customers application of their products (Novozymes annual report, 2010)<sup>23</sup>.

This Danish company uses the products life style assessment to compare their technology to competing technologies and in that comparison turned out most of the time that the infant technology is the best choice when it comes to climate change.

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<sup>22</sup> <http://www.novozymes.com/en/investor/financialreports/Documents/The%20Novozymes%20Report%202010.pdf>

<sup>23</sup> <http://www.novozymes.com/en/investor/financialreports/Documents/The%20Novozymes%20Report%202010.pdf>

Focusing on why Novozymes decided to focus on CSR and sustainability it is very important to underline that there are two different reasons: moral and financial. Concerning the former, Novozymes considers that it is a good thing to do good and the latter relates to the business aspect since Novozymes can make money from it.

Novozymes website (2010)<sup>24</sup> underlines that, in the transportation field, only biofuels represents an available option to reduce CO2 emissions in a large-scale. A very useful and sustainable alternative is ethanol, which helped reduce US greenhouse gas emissions by approximately 20 million tons in 2008 alone - equivalent to taking more than 5 million cars off the road (Novozymes website, 2011)<sup>25</sup>. In addition to that, the same Novozymes website (2011) explains in details how important ethanol is: only by adding a 10% ethanol blend to ordinary gasoline, reduces CO2 emissions of 3-6%.

It is very important to start using biofuels because they reduce notably the environmental impact in the transportation sector. Economic growth can be fostered by biofuels in both rural and developing areas (Novozymes website, 2009)<sup>26</sup>. Needless to say that the agricultural areas are the one that can get the most benefits out of biofuels. Novozymes is working on finding alternatives solutions to oil. This Danish firm wants to promote the usage of alternative and sustainable fonts of fuels. In developing countries a lot of money are needed for the oil purchase and most of the times this expense exploit all the resources needed to buy other fundamental items to get people out of poverty. For all these reasons, Novozymes is fostering the utilization of biofuel program because thanks to this program can achieve the following benefits: being less dependent from oil, build both an agriculture and domestic energy industry that will provide them revenues instead of costs only (Novozymes annual report, 2010)<sup>27</sup>.

The attention that Novozymes has concerning developing countries is also highlighted by their new R&D center opened in India on the 22<sup>nd</sup> of November 2010. This center will act as a resource base for the company's global discovery projects (Novozymes website, 2010)<sup>28</sup>.

This center has been inaugurated by Novozymes' Chief Executive Officer, Steen Riisgaard and Executive Vice President for Research & Development, Per Falholt (Novozymes website, 2010).

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<sup>24</sup> <http://www.novozymes.com/en/sustainability/sustainability-priorities/climate/Pages/Transport-and-the-environment.aspx>

<sup>25</sup> <http://www.bioenergy.novozymes.com/biofuel-basics/bioethanol-advantages/>

<sup>26</sup> <http://www.bioenergy.novozymes.com/nz2010/index.php?kid=6>

<sup>27</sup> <http://www.novozymes.com/en/investor/financialreports/Documents/The%20Novozymes%20Report%202010.pdf>

<sup>28</sup> <http://www.novozymes.com/en/news/news-archive/Pages/45952.aspx>

Novozymes' Regional President in India, G.S. Krishnan, explained why is Novozymes important for India: *"Our Indian management team has found a facility that can accommodate both the needs of the Indian business in order to deliver on our growth promise and the growing demand for global shared services. We believe that this space creates a prominent landmark for Novozymes in India and is geared to accommodate the growth of Novozymes in India in coming years"* (Novozymes website, 2010)<sup>29</sup>.

The main focus of this newly open center is on the development of innovating food applications for the Indian market. In order to develop it, researches have been conducted to understand the local needs. This Danish company core mission is to help other companies *"to make more from less"* (Novozymes annual report, 2010)<sup>30</sup> thanks to the fact that the company's enzymes and microorganisms have two different positive effects: on the one hand, they save energy and raw materials and on the other hand they reduce waste.

The results are evident: *"higher productivity, lower costs, and a better environment"* (Novozymes website, 2010)<sup>31</sup>. In addition to what mentioned above, sustainability is an integral part of Novozymes business. As presented in the Novozymes annual report (2009)<sup>32</sup>, one of the main characteristics of this firm is that Novozymes' customers play an important role in the challenge against climate change. This is related to the fact that Novozymes has been able to develop products with a very low environmental impact. A reduction of 40 million tons of CO<sub>2</sub> emissions has been possible thanks to the application of Novozymes products in 2010. (Novozymes report, 2010).

As stated in the Novozymes annual report (2009), Novozymes supports the following agreements:

- It subscribe to the United Nations Global Compact
- It support the United Nations Declaration of Human Rights
- It support the United Nations Convention on Biological Diversity
- It subscribe to the International Chamber of Commerce's Charter for Sustainable Development

In light of what already stated above, Novozymes is an active participant in the fight against climate change. A further initiative taken by this Danish firm has been the reduction of its own carbon footprint. According to Novozymes Report (2010), this company set a 2015 efficiency target to improve CO<sub>2</sub> efficiency by 50% compared to 2005.

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<sup>29</sup> <http://www.novozymes.com/en/news/news-archive/Pages/45952.aspx>

<sup>30</sup> <http://www.novozymes.com/en/investor/financialreports/Documents/The%20Novozymes%20Report%202010.pdf>

<sup>31</sup> <http://www.novozymes.com/en/news/news-archive/Pages/45952.aspx>

<sup>32</sup> [http://report2009.novozymes.com/Service/Download+report/NZ\\_AR09\\_EN.pdf](http://report2009.novozymes.com/Service/Download+report/NZ_AR09_EN.pdf)

The Novozymes report (2010) highlighted an improvement of 38% in 2010, compared to 24% in 2009; therefore, there has been an improvement on CO2 efficiency by 14 %-points.

This improvement has been possible thanks to the engagement in several projects, such as for example the decision to take electricity from wind turbines.

In addition to that, the company is really involved in the global CO2 emissions reduction. Novozymes managed to achieve a notable improvement from 2009 to 2010 with a reduction of 40 million tons through Novozymes customers' application of the firm products.

This has been possible through an improvement in the product performance followed by an increased sales volume of products with a high CO2 reduction potential (Novozymes report 2010)<sup>33</sup>.

The firm long-term resource efficiency targets for energy and water are linked directly to minimizing environmental impact, increasing cost efficiency and long-term risk management.

The achievement of Novozymes target concerning renewable energy and CO2 emissions reduction depends on the availability of preferred energy sources. More specifically, this Danish firm is strictly connected to the expansion of the renewable energy markets in both China and the US (Novozymes report, 2010). A final aspect to take into consideration regarding Novozymes is that this firm employs organizational performance targets related to climate change.

To sum up, all the policies started by Novozymes in terms of sustainability represent a success.

It makes sense for the firm to keep doing these kinds of strategies for different reasons. Both all the employees and the top managers are very much engaged in these kinds of policies.

Through an analysis of some of the most important sustainability ratings<sup>34</sup>, it can be easily noticed that, in the vast majority of time, Novozymes reaches very high positions.

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<sup>33</sup> <http://www.novozymes.com/en/investor/financialreports/Documents/The%20Novozymes%20Report%202010.pdf>

<sup>34</sup> <http://www.novozymes.com/en/news/news-archive/Pages/Novozymes-receives-gold-ranking-in-Dow-Jones-Sustainability-Index.aspx>

The table below shows the main internal and external strategies and initiatives for the aforementioned process focus firms:

	<b>Internal</b>	<b>External</b>
<b>PepsiCo</b>	Analysis of the different impact that direct and traditional seeding rice have on global warming,	Teach the local farmer the paddy's direct seeding technique in India
<b>Unilever</b>	Projects based on impact reduction, adaptation to local climatic conditions and GHG emissions reduction	Creation of a system for recycle and store the rainwater in East-African Countries
<b>Kimberly-Clark</b>	Foster the creation of more environmentally friendly techniques in the paper industry	Reduction of CO <sub>2</sub> and protection of coastal ecosystems in Brazil
<b>Novozymes</b>	Promotion of the usage of alternative and sustainable fonts of fuels	Promotion of the usage of biofuels to foster the economic growth in both rural and developing areas

**Table 6: Internal and External strategies for process focus firm**

To sum up, chapter 5 represents one of the core chapters of the overall project since it points out the differences present between product and process focus firms. All the different cases presented and analyzed represented good examples of projects and initiatives started by different MNCs to combat climate change focusing on developing countries.

It has been illustrated through all those cases that there are several types of activities that MNCs can take to combat climate change: one of the most important common point encountered between all the projects presented is that it is fundamental for firms to develop training programs for local farmers in order to give them the possibility to apply on their own the techniques developed by the firms. Furthermore, it has been highlighted that sustainable projects can improve both the economical and social situation of the country.

## 6.0 How executives think about climate change

To have a clearer overview concerning how companies think about climate change, I focused my attention on a McKinsey global survey (2007).

The main purpose of this survey is to illustrate, through the different exhibits attached below, the climate change issue from the firms' perspective. After illustrating how executives think about climate change, the last graph attached in this chapter, created by the World Bank (2009), gives an overview on whether people consider the climate change as a serious problem or not.

What distinguishes this chapter from the previous one is that here the focus is on how firms think about climate change while chapter 5 focused on what are the activities that MNCs start to combat climate change.

### 6.1 McKinsey global survey (2007)

According to the first exhibit, it is possible to notice that 60% of respondents said that climate change is a very important element for their company. This issue is considered in their overall corporate strategies (McKinsey, 2007). The companies that give the biggest importance to this issue are situated in Asia-Pacific (71%), countries such as Hong Kong, Singapore, Japan, South Korea, Taiwan, The Philippines, Australia and New Zealand. After this region, there is China (68%) and Europe (65%).

Furthermore, almost 70% consider that climate change does influence a lot in terms of corporate reputation and brands (McKinsey, 2007).

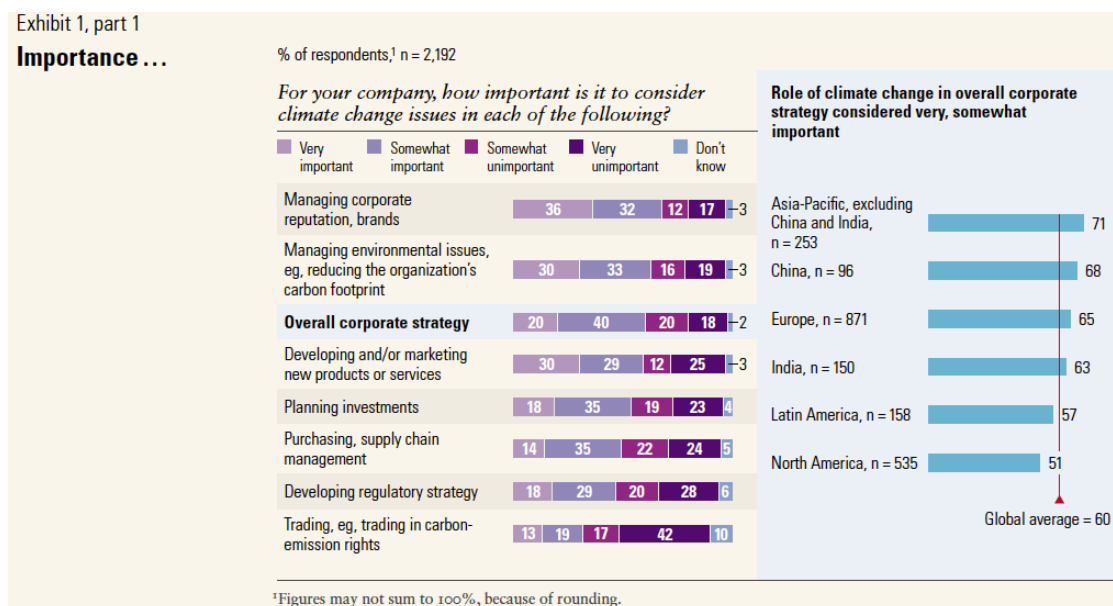


Figure 4: McKinsey Quarterly survey on climate change (2007), exhibit 1 part 1

Despite of the entire stated above, exhibit 1 part 2 shows that although companies mention to care about climate change, only few transfer their words into facts. Only 36% of global executives never consider climate change in corporate strategy (McKinsey, 2007). Needless to point out that in those regions where the environment has been an important public issue, companies are more active. This happens in countries such as China and India (McKinsey, 2007).

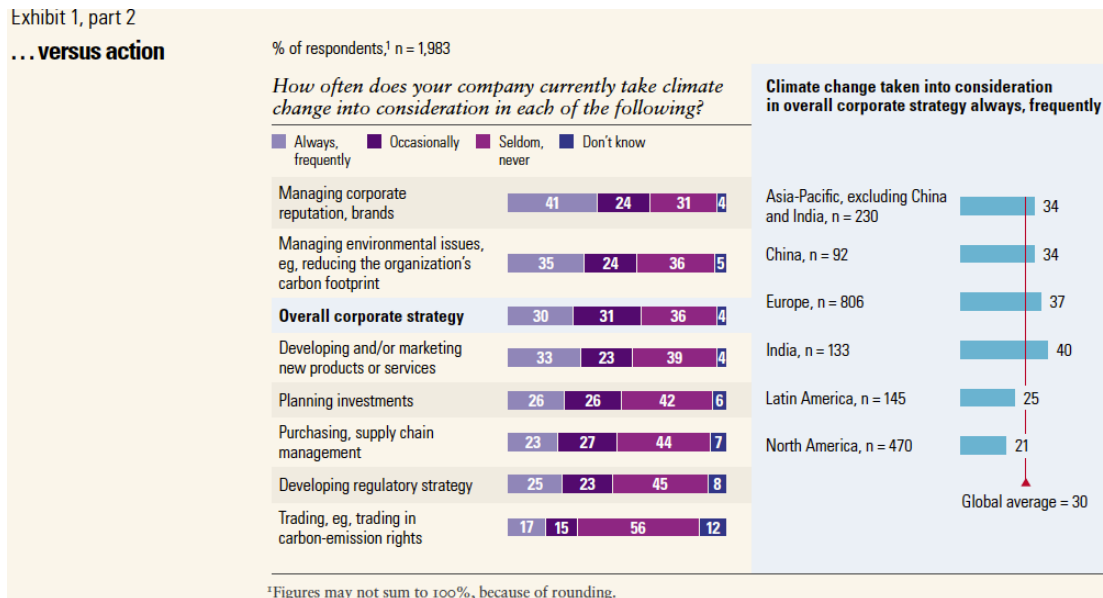
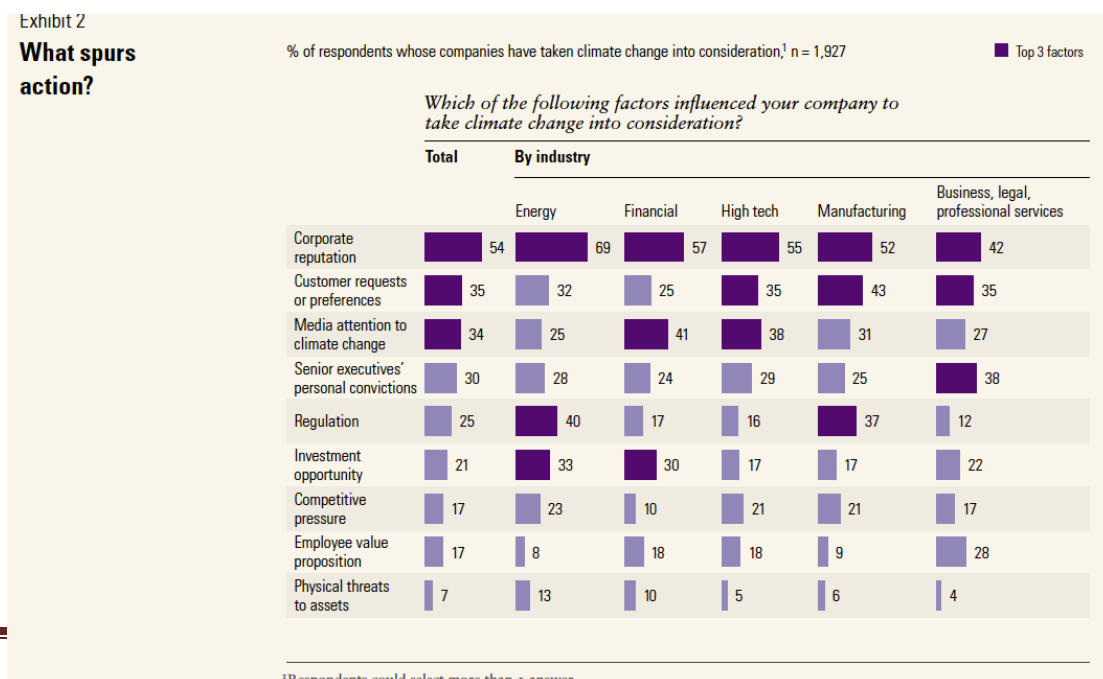


Figure 5: McKinsey Quarterly survey on climate change (2007), exhibit 1 part 2

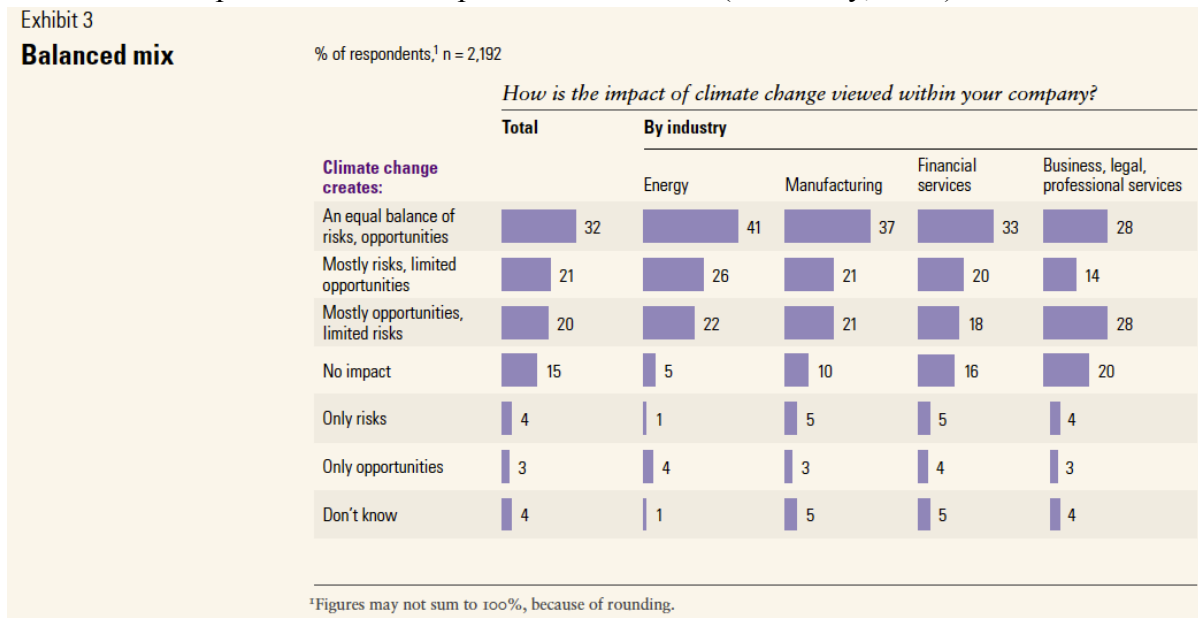
The main reasons why companies decide to play an active role to combat climate change are illustrated in the following exhibit. Executives in Asia-Pacific countries mention most of the time reputation (62%) as the core reason why they decide to get involved into actions to combat climate change, while in Latin America firms do so for media attention to climate change (40%) and regulation (38%) (McKinsey, 2007).



**Figure 6: McKinsey Quarterly survey on climate change (2007), exhibit 2**

Exhibit 3 takes into consideration how executives view the impact of climate change within their companies. Concerning the result, it is important to notice that the majority of the pooled people consider both opportunities and risks equally balanced.

If on the one hand, executives in Europe are the most optimistic one, on the other hand the most pessimistic are the respondents in developed Asian countries (McKinsey, 2007).



**Figure 7: McKinsey Quarterly survey on climate change (2007), exhibit 3**

The importance of climate change is emphasized also by its influence on profits.

The following question has been posed: “*What effect, if any, do you think climate change will have on your company’s profits over the next five years?*” (McKinsey, 2007). It is possible to find the answer in the exhibit below. 61% expect a very positive effect on profits if their companies manage well the climate change issue. If we have a look at it in terms of regions, executives in Europe are the one who agree the most, where 66% think that if managed very well, the effect of climate change might be very positive. In contrast with this perception are the Chinese executives, who report that the effect of climate change will be very negative even if managed in an appropriate way (McKinsey, 2007).

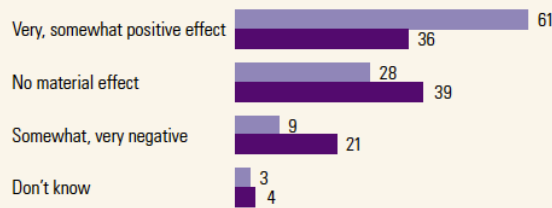
Exhibit 4

## Climate change and profits

% of respondents,<sup>1</sup> n = 2,192

*What effect, if any, do you think climate change will have on your company's profits over the next 5 years?*

■ If company were to manage issues related to climate change very well  
■ If company continues to manage issues related to climate change as it does today



<sup>1</sup>Figures may not sum to 100%, because of rounding.

Dec 2007 McKinsey Quarterly survey on climate change

**Figure 8: McKinsey Quarterly survey on climate change (2007), exhibit 4**

This exhibit focuses on the following question: “*where do the management responsibilities for climate change reside within the company?*” (McKinsey, 2007).

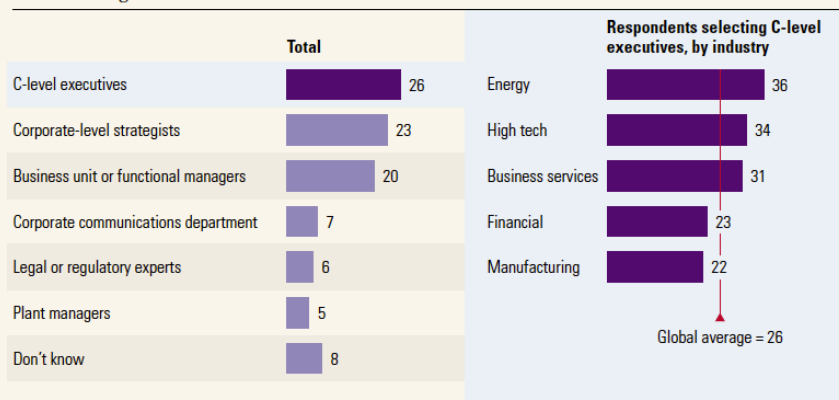
The majority of the respondent point out that their companies do not employ organizational performance targets related to climate change. According to this view, 70 % of global executives report that their companies do not include formal target related to climate change in the performance dialogues (McKinsey, 2007).

Exhibit 5

## Who's responsible?

% of respondents,<sup>1</sup> n = 1,927

*Within your company, which group of managers has the most responsibility for ensuring that climate change is taken into consideration?*



<sup>1</sup>Respondents who answered “other” are not shown.

**Figure 9: McKinsey Quarterly survey on climate change (2007), exhibit 5**

The last exhibit relates to regulation and it highlights a very significant fact: when companies do not consider managing environmental issue as an important aspect to focus on, they do not even define corporate emissions target for greenhouse gases (McKinsey, 2007).

Nevertheless, this situation should not last for too long since more than 80% of global respondents indicate they expect their companies to start up some form of climate change regulation within the next five years. Concerning regulation, 6 out of 10 executives assumed to have regulation in the forms of technical standards.

To sum everything up, the vast majority agrees that the effects of any kind of regulations on profits are more likely to be negative than positive (McKinsey, 2007).



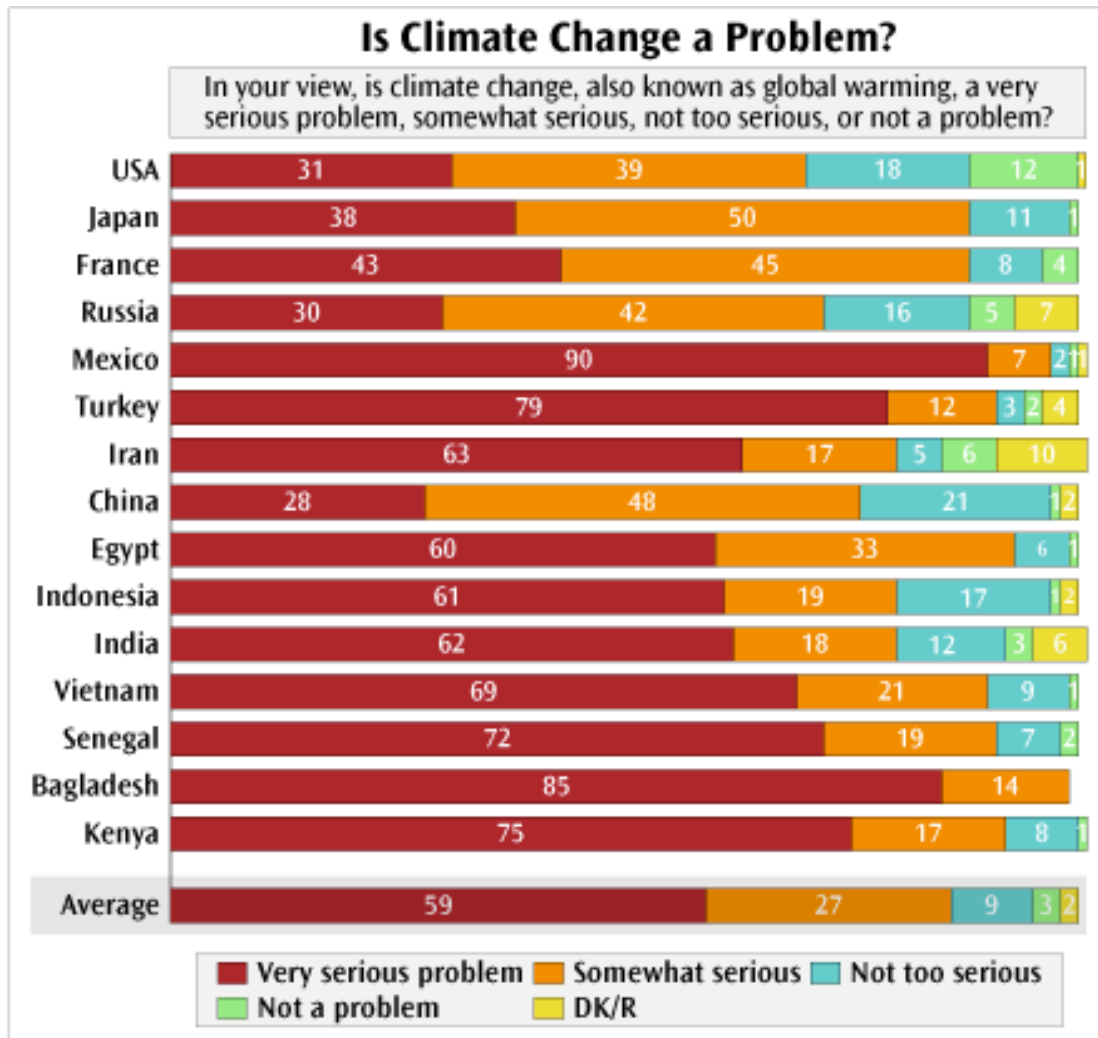
**Figure 10: McKinsey Quarterly survey on climate change (2007), exhibit 6**

To have a further idea about how dangerous people consider climate change, it is very important to analyze the poll created by the World Bank in 2009. This poll has been run before the two-week conference hosted in Copenhagen. As stated in the World Bank website (2009)<sup>35</sup>, questions such as how dangerous this issue is and if climate change should be consider as a very important issue by local governments have been posed to more than 13,000 people in 15 countries.

<sup>35</sup> <http://blogs.worldbank.org/eastasiapacific/poll-average-citizens-in-china-vietnam-indonesia-favor-action-on-climate-change-even-there-are-cos>

A very important aspect that needs to be underlined is that the majority of people interviewed were coming from developing countries, since those are the one affected the most by the above-mentioned issue.

In the graph attached below, it is possible to notice a summary of all the responses obtained:



**Figure 11. “Is climate change a problem?”** *Source: The World Bank, (2009)*

The high majority of people in countries such as Mexico, Bangladesh, Turkey, Kenya, Senegal and Vietnam consider the climate change issue as a very serious problem and therefore they push their governments to take active actions to combat this issue, even though there is a cost to be paid.

Thus, it is possible to state that there is a growth in the awareness that climate change represents an issue that need to be tackled straightaway.

Chapter 6 presented a survey conducted by McKinsey (2007) on how executives think about climate change. The main conclusions that can be drawn from this chapter are based on the fact that, worldwide, the companies who focus more attention on the climate change issue are located in

the Asia-Pacific region (McKinsey, 2007). Furthermore, it has been illustrated that in most cases executives believe that getting involved into actions to combat climate change does influence a lot in terms of corporate reputation and brands (McKinsey, 2007).

Another very important aspect that has been pointed out in this chapter is that the majority of executives think that, if firms manage to tackle well the climate change issue, this can provide them with a very positive effect on the firm's profits.

## 7. Analysis

The scope of this chapter is to underline how the different companies taken into consideration in my project are dealing with the climate change issue. The analytical framework presented on chapter 4 has been implemented in this section in order to describe the above-mentioned issue.

The following four points that form the analytical framework have been applied to the different firms analyzed:

- I. Strategy/policies
- II. Organization/procedures
- III. Communication/outreach
- IV. Projects

It is important to clarify that not to all the times it was possible to apply the four points above-mentioned to all the firms taken into consideration.

### 7.1 How are MNCs dealing with climate change?

The first step to take into account while analyzing them, it is to differentiate how firms are dealing with the climate change issue from “why firms are doing so”, which will be discussed in the next chapter. Applying the analytical framework to Vestas, it is remarkable to underline that, Vestas’ strategy aims to expand towards new markets through the establishment of new wind turbines in emerging markets, such as India and China. When a firm decides to start its operations abroad, having a good local network plays a vital role for the success of the firm’s strategy.

This is possible especially thanks to the good connection Vestas has with local governments and authorities, as underlined by Jens Tommerup, president of Vestas China (2010)<sup>36</sup>.

Concerning projects, Vestas already started several projects in developing countries such as China, where it opened its China Technology R&D Centre in 2010, and India to provide these countries an alternative and sustainable way to produce energy (Vestas website, 2010)<sup>37</sup>.

Regarding Syngenta, this Swiss firm focuses its “how” part on the creation of making products in a sustainable way, which can help both the local communities and the local economies saving water, energy and other important resources. The main strategy Syngenta is following is based on making sugar that could be used either for food or converted into biofuel (WBCSD report, 2009).

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<sup>36</sup> <http://www.vestas.com/en/media/news/news-display.aspx?action=3&NewsID=2412>

<sup>37</sup> <http://www.vestas.com/en/media/news/news-display.aspx?action=3&NewsID=2389>

Syngenta is involved in different projects in several developing countries. The core purpose of all these projects is to create a closer link between the company and the population, through training programs for local farmers to become familiar with the company's techniques (Syngenta website, 2011)<sup>38</sup>.

The WBCSD report (2009) presented another similar case, the one offered by PepsiCo. This American firm is committed to sustainable agriculture in developing countries, through the practice of the paddy's direct seeding technique.

PepsiCo in particular decided to start up a new project based on paddy's direct seeding technique in India since this country is among the largest rice growers in the world. The project is working very well thanks to the fact that local farmers are taught how to use and take advantages from the new techniques (WBCSD report, 2009). PepsiCo's strategy is based on the fact that only after testing the effectiveness of the new techniques, this American firm starts training the local farmers and this aspect gives them the possibility to become more confident with the new method (PepsiCo India website, 2011)<sup>39</sup>. Thanks to this technique, local farmers are able to achieve a methane emissions reduction and to save water (WBCSD report, 2009).

A further characteristic of PepsiCo's policy is to test the new technology developed completely and only in case of a successful feedback the company takes the decision to teach the new technology to local farmers present in developing countries (PepsiCo website, 2011)<sup>40</sup>. As illustrated in the WBCSD report (2009), PepsiCo's main project in India started in 2004 when the American company conducted some experiments through the direct seeding of rice in its R&D fields. In addition to that, the WBCSD report (2009) depicted that PepsiCo gave its availability to cooperate with the United Nations Framework Convention on Climate Change (UNFCCC) in order to have direct seeding of paddy included as an approved means to earn carbon credits.

Sompo Japan bases its strategy against climate change on ensuring people against changing climate change conditions. Its weather index provides instant reimbursement for the loss of profits. This company decided to focus on South-east Asia where weather-related risk is difficult for local farmers to handle (WBCSD report, 2009).

The future projects of the company focus on expanding the technique used in Thailand in other Asian developing countries to combat climate change (Sompo Japan website, 2011)<sup>41</sup>.

Concerning Unilever, this British-Dutch firm wanted to combat the climate change issue through focusing on how to help reducing the deforestation problem (Unilever website, 2011)<sup>42</sup>.

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<sup>38</sup> <http://www.syngenta.com/global/corporate/en/about-syngenta/Pages/company-history.aspx>

<sup>39</sup> <http://pepsicoindia.co.in/>

<sup>40</sup> <http://www.pepsico.com/>

<sup>41</sup> <http://www.sompo-japan.co.jp/english/>

In order to do that, Unilever developed a campaign based on the plantation of new trees. This can be explained by pointing out that forests play a vital role on local water cycles. Due to the shrink of forests, rainfall patterns are modified and therefore longer dry seasons are taking place.

Regarding projects, as illustrated in the WBCSD Report (2009), Unilever developed a program to identify drought-tolerant tea varieties. Besides that, Unilever developed other projects based on tree plantation to combat deforestation in emerging African countries.

In addition to Unilever, there is another company that decided to focus on develop a project aimed to implement the land-use: the American firm Kimberly-Clark, as presented in the Sustainability Project Mosaic, (2007)<sup>43</sup>.

This firm settled the creation of a “sustainable forest mosaics” in Brazil (Kimberly-Clark website, 2011)<sup>44</sup>. In order for this project to be successful and efficient, the plantation of new forests plays a vital role. There are positive effects related to the plantation of new forests, such as watercourses protection and the possibility to store carbon reserves (WBCSD report, 2009).

Two are the main purposes that Kimberly-Clark would like to achieve trough the implementation of its strategy:

- The conservation of natural resources and forests
- Creation of employment for local people through the implementation of the above-mentioned mosaic strategy (Kimberly-Clark annual report, 2009)<sup>45</sup>

The last company analyzed is Novozymes. Among other things, this company focuses its strategy on finding sustainable alternative to oil in the transportation field. Ethanol and biofuels represent the alternatives to use fostered by Novozymes (Novozymes annual report, 2010)<sup>46</sup>.

Concerning Novozymes project, it is significant to underline the opening of a new R&D center in India. As stated on the Novozymes website (2010)<sup>47</sup>, the main purpose of this center is to represent a resource base for the company’s global discovery projects.

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<sup>42</sup> <http://www.unilever.com/>

<sup>43</sup> [http://www.conservation.org/sites/celb/Documents/Forest\\_Mosaic\\_Sheets\\_English.pdf](http://www.conservation.org/sites/celb/Documents/Forest_Mosaic_Sheets_English.pdf)

<sup>44</sup> <http://www.kimberly-clark.com/>

<sup>45</sup> [http://www.cms.kimberlyclark.com/umbracoimages/UmbracoFileMedia/2009%20Annual%20Report\\_umbracoFile.pdf](http://www.cms.kimberlyclark.com/umbracoimages/UmbracoFileMedia/2009%20Annual%20Report_umbracoFile.pdf)

<sup>46</sup> <http://www.novozymes.com/en/investor/financialreports/Documents/The%20Novozymes%20Report%202010.pdf>

<sup>47</sup> <http://www.novozymes.com/en/news/news-archive/Pages/45952.aspx>

To sum up, this chapter depicts that there are different way that companies follow to become more sustainable and tackle the climate change issue. As far as implemented carefully and through a precise strategy, all of them are important and they all play a vital role in the challenge against climate change.

The tables below summarize how firms are dealing with the climate change issue:

	<b>Vestas</b>	<b>Syngenta</b>	<b>Sompo Japan</b>
<b>How are firms dealing with the climate change issue?</b>	Focuses on the installation of new wind plants in developing countries such as China and India	Focuses on developing a more sustainable way to make sugar in several developing countries	It insures people against changing climate condition. Mostly focused on Asian developing countries

	<b>PepsiCo</b>	<b>Unilever</b>	<b>Kimberly-Clark</b>	<b>Novozymes</b>
<b>How are firms dealing with the climate change issue?</b>	It is committed to sustainable agriculture in developing countries, especially in India	Started a tree-planting program in different African countries such as Kenya and Tanzania	Launched “The unique Sustainable Forest Mosaics Initiative” in Brazil. The project aims to implementation of land-use and conservation activities	When Novozymes’ products are used in developing countries it is possible to see their effects when customers buy Novozymes’ products

**Table 7: How are firms dealing with the climate change issue?**

## 7.2 Why are MNCs engaging in different activities to combat climate change?

The core purpose of this chapter is to give a clear overview of the main reasons why firms are dealing with the climate change issue.

Related to the question why firms decide to deal with the climate change issue in developing countries, it is important to analyze that the companies I took into consideration have different way to answer this question. From the data encountered and from the interview conducted, it is significant to point out that the majority of the companies analyzed decided to start tackling climate change for both CSR and market reasons.

Among the firms taken into consideration, Vestas appears to be involved into activities to combat climate change mostly for market reasons. This has been underlined by the fact that this firm during the last years opened up towards emerging markets such as China and India, where it has been able to develop a very strong presence (Vestas website, 2010)<sup>48</sup>. Entering new markets give the firm the possibility to sell more and earn more money.

Besides Vestas, Novozymes is another firm that decided to get involved into activities to combat climate change in developing countries for market reasons. Due to this fact, Novozymes opened up a new R&D center in India (Novozymes website, 2010)<sup>49</sup>. Furthermore, this Danish company is engaged in these kinds of activities to have a good reputation. Needless to say that by having a good reputation, a firm can gain different advantages from the consumer point of view.

In addition to the companies stated above, PepsiCo is characterized by having both a CSR and a market approach. New opportunities can arise for firms because their client range will increase and furthermore they could take advantages of the natural resources present in developing countries. India represents the developing country in which PepsiCo mostly focused on (PepsiCo India website, 2011)<sup>50</sup>.

Another firm that decided to start activities to combat climate change for both CSR and market reasons is Unilever. This British-Dutch company developed a technique through which recycle and store the rainwater (Unilever website, 2011)<sup>51</sup>.

Besides Unilever, the Swiss company Syngenta represents another example of CSR and market oriented firm. The main aim of this company is to save energy throughout sugar that could be used either for food or converted into biofuel (Syngenta website, 2011)<sup>52</sup>. This Swiss firm started

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<sup>48</sup> <http://www.vestas.com/en/media/news/news-display.aspx?action=3&NewsID=2389>

<sup>49</sup> <http://www.novozymes.com/en/news/news-archive/Pages/45952.aspx>

<sup>50</sup> <http://pepsicoindia.co.in/>

<sup>51</sup> <http://www.unilever.com/sustainability/casestudies/Biodiversity/KenyaTeaplantationbiodiversityinitiatives.aspx>

<sup>52</sup> <http://www.syngenta.com/global/corporate/en/about-syngenta/Pages/company-history.aspx>

sustainable projects in developing countries present all over the world: Egypt in Africa, Brazil and Colombia in South America and India, China and Vietnam in Asia (WBCSD report, 2009).

To better understand what the CSR aspect is related to, it is important to underline that all the above-mentioned firm developed innovative and sustainable processes to combat climate change.

Kimberly-Clark is another firm that focuses a lot of its attention on the development of CSR policies. The core objectives of the project initiated by this American firm are a reduction of CO<sub>2</sub> and the protection of coastal ecosystems (Kimberly-Clark website, 2011)<sup>53</sup>.

From the list of firms analyzed, Sompo Japan is the one that took the decision to combat climate change also for legal reasons. Since it is an insurance company, it developed the idea to insure people against changing climate change conditions (Sompo Japan website, 2011)<sup>54</sup>. During the last few years, there has been an important proliferation of natural disasters such as floods, hurricanes and typhoons due to the changes that are occurring in the climate (Schwartz and Randall, 2003). Sompo Japan developed the possibility to get insured against these kinds of natural phenomenon (Sompo Japan annual report, 2009)<sup>55</sup>. This Japanese company mainly concentrated its attention on Thailand since this developing country is characterized by a protracted rain season.

In addition to what stated above, the importance of climate change is emphasized also by its influence on profits. The McKinsey global survey (2007) presented in chapter 6 illustrated that 61% of the executives interviewed, mostly European, think that climate change could affect profits in a positive manner if companies are able to well manage the climate change issue.

In contrast with this perception are the Chinese executives, who report that the effect of climate change will be very negative even if managed in an appropriate way (McKinsey, 2007).

To sum up, it is very important to underline that all companies should get involved as soon as possible into actions to combat climate change. This is due to the fact that, in the future, costs will be higher if firms decide not to act now to implement sustainable activities against climate change.

In addition to that, negative procedures could be applied to executives that choose not to get involved into environmental activities.

The tables below depict why firms are dealing with the climate change issue:

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<sup>53</sup> <http://www.kimberly-clark.com/>

<sup>54</sup> <http://www.sompo-japan.co.jp/english/>

<sup>55</sup> [http://nksj-hd.com/ir/data/annual/backpdf/sompo/2009/SOMPO09\\_all.pdf](http://nksj-hd.com/ir/data/annual/backpdf/sompo/2009/SOMPO09_all.pdf)

	Vestas	Syngenta	Sompo Japan
<b>Why are firms dealing with the climate change issue</b>	Market	CSR/Market	Legal

	PepsiCo	Unilever	Kimberly-Clark	Novozymes
<b>Why are firms dealing with climate change</b>	CSR/market	CSR/market	CSR/Moral	Reputation/market

**Table 8: Why are firms dealing with the climate change issue?**

Therefore, this analysis chapter presented both how firms are dealing with the climate change issue and why they are doing so. Concerning the “how” part, different projects presented in the WBCSD (2009) related to several firms have been presented, pointing out that it is possible to start up different projects to reach the same purpose: tackling the climate change issue.

The second part of this chapter focused on why firms decided to start activities to combat climate change in developing countries. It has been underlined that there are specific aspects that drive companies to get involved into activities to combat climate change.

## 8. Discussion of the findings encountered in the analysis

The following section will start with assessing general theories and subsequently work towards more specific issues brought up during the research.

Firstly, it is important to underline the fact that the different theories used to implement the analytical framework point out the different reasons that push MNCs to combat climate change in developing countries. The main reason why I decided to focus only on few theories is because they are the most representative of the issues researched in this project and moreover because they are the most suitable to find an answer to the research question.

Secondly, in this section the focus will be on what has been found through the implementation of my analysis and through the data sources collected. I will investigate what sort of projects MNCs decided to develop in developing countries to combat climate change.

Finally, I will conclude by applying the theoretical discussion and empirical findings in order to further examine how all the projects developed by the MNCs taken into consideration help tackling climate change in developing countries.

Thanks to all the different sights taken into consideration, it is possible to have a clearer overview of why MNCs decide to tackle climate change in developing countries.

The first very significant aspect encountered in the analysis is related to the fact that MNCs tailor their strategies according to the core characteristic of the nation in which they decide to get involved in. The different reasons that foster firms to get involved into activities to combat climate change in developing countries are legal, market, reputation, moral and CSR.

The dependent variable of this research is the following: MNCs practices to combat climate change in developing countries. Focusing on the above-mentioned dependent variable, it has been possible to notice that there is an always-growing number of firms that decide to combat the climate change issue, especially in developing countries. The dependent variable focused on the following different types of activities: strategy, organization, communication and projects.

All the cases implemented in the previous chapters emphasize firms' vigorous involvement in developing countries. Through an analysis of all the companies taken into consideration, it has been discovered that there are both product and process focused firms.

All the projects presented help the reduction of climate change in developing countries. Different approaches have been offered but they all represent good examples of techniques that, if implemented in the right manner, will help to tackle climate change.

To drive further the discussion related to the findings encountered in the analysis, it is very important to take into consideration the toolkit for corporate leader developed by the Ceres report (2006). This toolkit has been created to help corporate leader managing the opportunities and risks related to climate change.

The above-mentioned report presents the following different kinds of risks:

- Physical Risks
- Regulatory Risk
- Competitive Risk
- Technological and Competitive Risks and Opportunities (Ceres report, 2006)

Taking into consideration the first category, businesses are at risk from the physical impacts of climate change. The increase of natural catastrophes due to global warming affects directly the business in a negative manner. Concerning the second typology of risks, it has to do with the fact that states are putting a lot of pressure on companies to reduce GHG emissions.

The company ability to compete will be measured in term of climate risk preparedness: this has to do with competitive risk (Ceres report, 2006). Regarding the last typology mentioned above, it highlights how firms can obtain advantages from climate change, how opportunities can arise through the involvement into activities to combat climate change.

This can be done through the development of new sustainable products that meet consumer demands (Ceres report, 2006).

Therefore, if on the one hand firms do have to pay attention to all the different kinds of risks related to the involvement into practices to combat climate change, on the other hand it is very important to underline that if well-organized and managed, firms have the possibility to take advantage of the opportunities present in connection with the climate change issue.

By applying the theoretical discussion and empirical findings to further examine how all the projects developed by the MNCs taken into consideration help tackling climate change in developing countries, there are several significant aspects to focus on. As stated already in chapter 3, different theories have been presented in my project.

To compare the theories analyzed and the empirical evidence, it is important to underline that all the different MNCs, throughout the development of projects to combat climate change in developing countries, followed the main points illustrated in the theory chapter.

As pointed out by Hansen (2003), it is very significant for firms to have good relationship with local government and authorities. This is due to the fact that having a good connection allow firms

to start operations faster. It is fundamental to have a good network in order to succeed when a firm wants to enter a new market. To relate this part of theory illustrated by Hansen (2003) to the empirical evidence presented in the case studies taken into consideration, it is possible to state that this theory has been followed by Vestas. As underlined by Jens Tommerup (2011)<sup>56</sup>, president of Vestas China, the support of the Chinese government has been fundamental to enhance the growth of the wind energy industry. The two case studies presented in the WBCSD report (2009) related to Syngenta and PepsiCo can be connected to the theory developed by Porter and Kramer (2006).

These two authors underlined that one of the companies' main strengths is related to their resources and know-how because thanks to that, they can change this state of affairs in both the developed and developing world. Thus, the WBCSD report (2009) depicted the training programs for local farmers to become familiar with the firms' techniques developed by both Syngenta and PepsiCo. The empirical evidence provided by Novozymes and Unilever study cases, included into the WBCSD report (2009) can be related to the stakeholder theory developed by Freeman (2006).

This theory is based on the fact that it is fundamental to promote an alternative way of doing business. The British-Dutch company created a system for recycle and store the rainwater in East-African Countries while Novozymes promoted the usage of alternative and sustainable fonts of fuels, such as biofuels.

To sum up, comparing the empirical evidences, obtained throughout the case studies analyzed, to the theories presented before, it is possible to notice that the most of the times MNCs have followed the guideline illustrated by different theories to start up actions and activities to combat climate change in developing countries.

In order to state what is the theory that suits my project the most, it is very important to take into consideration that there are several theories that explain the decision of MNCs to get involved into actions to combat the climate change issue in developing countries.

After a deep analysis of all the theories taken into consideration, it is needless to say that there is no such a theory that gives an enough detailed explanation on what are the reasons that push firms to combat climate change in developing countries. Hence, it is possible to state that there is no theory that can be considered better than the others but rather complementary to each other.

Another very important aspect that needs to be taken into account is that the whole project relies mainly on secondary data. The most important aspect to be taken into consideration concerning secondary data is that main weaknesses could be encountered in terms of accuracy and relevance.

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<sup>56</sup> <http://www.vestas.com/en/media/news/news-display.aspx?action=3&NewsID=2412>

This brings to wonder how much all the valuations provided by different institutions are either precise or not.

In light of what stated above, it is fundamental to interpret prudently the data acquired and furthermore there is a strong need for the situation to be analyzed from different points of view.

Therefore, to sum up, the following conclusion might be drawn: there are still several aspects that need to be deeply investigated and evaluated to have a clear understanding on the reasons that push firms to combat climate change in developing countries. This differs a lot according to the following aspects: type of firms, country they are going to, firms' core business decisions missions.

## 9. Conclusion

This project aims at analyzing the importance of MNCs climate change activities in developing countries. Different theories have been taken into account to analyze this issue and different reasons why firms decide to start activities to combat climate change have been taken into deep consideration. The climate change issue in developing countries has a core importance for MNCs for several reasons. This is due to the fact that, at the present time, there are an increasing number of activities undertaken by MNCs in developing countries (Petkoski, 2003). Moreover, due to differences between local and host country regulations, it is less expensive for MNCs to meet the climate change issues in developing countries (Kolk, 2002).

The project has two important focus areas:

- What are the climate change practices of MNCs in developing countries?
- What are the driving forces of these practices?

This conclusion unfolds the key findings per focus area, providing a clear but condensed understanding of the project, giving priority to the understanding of how MNCs are addressing climate change problems in developing countries.

My project followed the resulting structure: first of all, I stated the project research question. Subsequently, the methodology has been presented and a complete list of all the theories applied has been provided followed by a description of the analytical framework applied.

The main body of the project has been focused on the one hand on what firms do in order to combat the climate change issue, while on the other hand why firms have different approaches to solve the above-mentioned issue. All the different approaches have been taken into consideration, providing reasons and specific examples of all the approaches analyzed.

Furthermore, a detailed explanation of the differences present between process focus firms and product focus firms has been provided.

All the firms taken as examples have been described, focusing especially on all the actions that they have implemented to combat the climate change issue in developing countries.

Both their innovative and sustainable products and processes have been taken into account aiming to reach a clear understanding of how firms' products and processes help tackling the climate change issue in developing countries.

The last two chapters presented the distinction between how MNCs are dealing with the climate change issue and why MNCs have different reasons to get involved to tackle climate change in

developing countries. The last part of the project has been characterized by a discussion of the findings encountered in the analysis followed by further perspectives for the optimization of MNCs activities against climate change in developing countries.

The research question presented has been the following: **what are the climate change practices of MNCs in developing countries? What are the driving forces of these practices?**

The research conducted unfolds that there are several reasons why firms decide to tackle the climate change issue in developing countries.

Concerning the practices that MNCs decide to apply in developing countries, a very important distinction has been made in my project:

- Product focus firm
- Process focus firm

In the first case, there are companies through the virtues of their products, which try to solve climate change problems. Firms' decision to follow this strategy is fostered by important commercial purposes. Related to the second case, companies are keen on developing sustainable processes and to get involved in green activities in developing countries to balance the CO<sub>2</sub> emissions they produce throughout the creation of their products.

To further examine the climate change practices of MNCs in developing countries, it is significant to take into consideration also what occur when firms do not consider managing environmental issue as an important aspect to focus on. In such a case, as illustrated in the McKinsey global survey (2007), companies do not even define corporate emissions target for greenhouse gases.

The focus of the whole project on developing countries has been underlined by the fact that all the projects that have been taken into consideration started by MNCs take place in developing countries spread all over the world.

The table below shows all the different developing countries in which the companies analyzed decided to start their activities to tackle climate change:

	<b>Vestas</b>	<b>Syngenta</b>	<b>Sompo Japan</b>	<b>PepsiCo</b>	<b>Unilever</b>	<b>Kimberly- Clark</b>	<b>Novozymes</b>
<b>Developing countries they focus on</b>	China, India	Brazil, China, Colombia, Kenya	Thailand	India	Kenya, Tanzania	Brazil	India

**Table 9: List of the developing countries analyzed in the project**

To provide a proper answer to what are the driving forces of MNCs activities to combat climate change, it is very significant to point out that both theory and empirical data showed that companies decide to tackle the climate change issue in developing countries due to legal, market, reputation, moral and CSR reasons. It is not possible to state that is present a unique reason that push firms to get engaged into activities to combat climate change in developing countries but it may be considered as a continuum spanning of actions undertaken from legal purposes to CSR commitments. These are the main driving forces of the practices followed by MNCs and hence answer to the research question of this project.

The contribution I provided to MNCs throughout my project is related to the fact that I presented the possible options that firms could follow to tackle the climate change issue in developing countries. Through a deep analysis of the cases presented, MNCs interested to get involved into activities to combat climate change can get important advices to follow. There is no one for all strategy that firms could follow.

This project contributes to science and knowledge creation through detailed presentation and analysis of theories and empirical evidence up to date. This project thus contributed to the clearness of the existing literature and firm activities, drivers of these activities and views on the complicated issue of climate change. In addition, it provided a clear understanding of MNCs activities to combat climate change in developing countries.

## 10. Further perspectives

As already mentioned in the methodology chapter, it is very important to take into consideration for the reader that the research project is based on a limited amount of resources available. Furthermore, it is needless to say that any action according to the issues set onward should therefore be based on further studies on the area.

Hence, it is important to highlight that the project has been problem-oriented and its main purpose has been to illustrate how MNCs tackle the climate change issue in developing countries.

In addition to that, a very important aim of the project was to point out that there are different approaches that MNCs decide to adopt in order to combat the climate change issue.

During the research conducted it has been possible to notice that it is fundamental for MNCs to start taking care of the climate change issue in the immediate future because if they do not to so, their businesses will be influenced in a very negative manner in the near future.

All the projects illustrated above depict the fact that there are high opportunities for firms to get involved into activities to combat climate change. A deep and real involvement is worthy for both the company and the local country. Therefore, after what it has been pointed out, it is significant to state that firms do have important and different strategies to implement in order to combat the climate change issue in developing countries.

A combination of a deeper involved of governments and institutions associated with all the positive results achieved by MNCs that have been already involved into activities to combat climate change in developing countries will definitely foster other companies to start new projects to tackle the above-mentioned issue. Climate change is a dangerous and imminent reality and since MNCs are able to tackle it, they cannot wait any longer to combat this issue. Waiting is not an option; action is the right path to follow.

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## 12. Appendices

### Appendix 1: Thesis executive summary

The topic I developed in this paper is based on the importance of multinational corporations (MNCs) activities to combat climate change in developing countries.

The climate change issue in developing countries represents a very important topic for MNCs for several reasons. First of all, as underlined by Petkoski (2003), nowadays the number of activities undertaken by MNCs in developing countries is increasing more and more. Moreover, due to differences between local and host country regulations, it is less expensive for MNCs to meet the climate change issues in developing countries (Levy, 2002). Within the project, deep explanation will be given concerning what foster MNCs to engage in climate change activities.

The project followed the resulting structure: first of all, I stated the project research question. Subsequently, the methodology has been presented and a complete list of all the theories applied has been provided followed by a description of the analytical framework applied.

The main body of the project has been focused on the one hand on what firms do in order to combat the climate change issue, while on the other hand why firms have different approaches to solve the above-mentioned issue. All the different approaches have been taken into consideration, providing reasons and specific examples of all the approaches analyzed.

Furthermore, a detailed explanation of the differences present between process focus firms and product focus firms has been provided. All the firms taken as examples have been described, focusing especially on all the actions that they have implemented to combat the climate change issue.

The last two chapters present the distinction between how MNCs are dealing with the climate change issue and why MNCs have different reasons to get involved to tackle climate change in developing countries. The final part of the project has been characterized by a discussion of the findings encountered in the analysis followed by further perspectives for the optimization of MNCs activities against climate change in developing countries.

The research question presented has been the following: **what are the climate change practices of MNCs in developing countries? What are the driving forces of these practices?**

The research conducted unfolds that there are several reasons why firms decide to tackle the climate change issue in developing countries.

Concerning the practices that MNCs decide to apply in developing countries, a very important distinction has been made in my project:

- Product focus firm
- Process focus firm

In the first case, there are companies through the virtues of their products, which try to solve climate change problems. Firms' decision to follow this strategy is fostered by important commercial purposes. Related to the second case, companies are keen on developing sustainable processes and to get involved in green activities in developing countries to balance the CO<sub>2</sub> emissions they produce throughout the creation of their products.

To further examine the climate change practices of MNCs in developing countries, it is significant to take into consideration also what occur when firms do not consider managing environmental issue as an important aspect to focus on. In such a case, as illustrated in the McKinsey global survey (2007), companies do not even define corporate emissions target for greenhouse gases.

The focus of the whole project on developing countries has been underlined by the fact that all the projects that have been taken into consideration started by MNCs take place in developing countries spread all over the world.

To provide a proper answer to what are the driving forces of MNCs activities to combat climate change, it is very significant to point out that both theory and empirical data showed that companies decide to tackle the climate change issue in developing countries due to legal, market, reputation, moral and CSR reasons. It is not possible to state that is present a unique reason that push firms to get engaged into activities to combat climate change in developing countries but it may be considered as a continuum spanning of actions undertaken from legal purposes to CSR commitments. These are the main driving forces of the practices followed by MNCs and hence answer to the research question of this project.

The contribution I provided to MNCs throughout my project is related to the fact that I presented the possible options that firms could follow to tackle the climate change issue in developing countries. Through a deep analysis of the cases presented, MNCs interested to get involved into activities to combat climate change can get important advices to follow. There is no one for all strategy that firms could follow.

This project contributes to science and knowledge creation through detailed presentation and analysis of theories and empirical evidence up to date. This project thus contributed to the clearness of the existing literature and firm activities, drivers of these activities and views on the complicated issue of climate change. In addition, it provided a clear understanding of MNCs activities to combat climate change in developing countries.

## **Appendix 2: Interview with Claus Frier, Novozymes sustainability manager (2011).**

### **1) When did Novozymes start to take care of the environment?**

Novozymes process to become a sustainable firm started long time ago since the company always had a set of specific values, focusing on trying to do business in an honest way. During the 70s and the 80s the debate on genetic engineering was very hard and Novozymes was basing most of its research, development and production on genetic engineering and genetically modified microorganisms. Novozymes had to build trust with stakeholders; it had to convince authorities as well as mayor green NGOs that they were able to use genetic engineering in a responsible way. When sustainable development and CSR came on the international agenda with the Brantlen report then it was relatively easy for Novozymes to adapt to that. It became really part of Novozymes business philosophy to be responsible, to do business in a decent way. Novozymes of course would like to earn a lot of money but not at any price and therefore Novozymes is very much focusing on integrating sustainable business into every activities. Novozymes customers want to know how the company can provide solutions to make their needs, their demands when it comes to climate change and sustainability.

To sum everything up, it is possible to state that Novozymes started to take care of sustainable business in the early 90s, when CSR began to become a very important issue for firms to look at. Novozymes became a member of the World Business Council for Sustainable Development (WBCSD) in the early 90s and they did their first environmental report in 1993. In 1998 Novozymes made its first social impact report and sustainability report after that.

### **2) Does Novozymes lobbies activities?**

Yes, Novozymes does lobbies activities.

### **3) Does Novozymes have CSR activities related to climate change in developing countries?**

Novozymes does not focus properly on developing countries. Related to climate change, Novozymes' strategy has three focus areas:

- Reduce its own emissions from its own factories and from its power suppliers
- Reduce emissions in Novozymes' supply chain
- Reduce their carbon footprint due to Novozymes' customers application of Novozymes' products

Novozymes' target is to enable a reduction of 75 millions tons of CO<sub>2</sub> in 2015 due to Novozymes' customers application of their products.

Novozymes uses the products life style assessment to compare their technology to competing technologies and in that comparison turned out most of the time that the infant technology is the best choice when it comes to climate change.

An example of the infant technology is that if a person wants to bleach paper in the paper industry you can use a chemical method to do it and it will be possible to have nice white paper. The same thing could be done using a biotech process and the user will get white paper.

In a life cycle context, the CO<sub>2</sub> emission is much less in the infant process compared to the chloride process and that is the way in which Novozymes tries to market its products into professional technologies.

#### **4) What is Novozymes doing in developing countries to combat climate change?**

Novozymes is not doing anything in particular related to climate change in developing countries but when Novozymes' products are used in such countries it is possible to see their effects when customers buy Novozymes' products.

This company is presented in several developing countries, such as Brazil, China and India as well as in the southern part of Africa.

#### **5) What are the main reasons that foster your firm to do so?**

- **Is Novozymes doing it for CSR purposes?**
- **Is Novozymes doing it because obliged by the Danish government?**
- **Is Novozymes doing it as part of a long-term strategic vision?**

Two are the reasons why Novozymes' focuses on CSR and sustainability: moral and financial. Concerning the former, Novozymes considers that it is a good thing to do good and the latter relates to the business aspect since Novozymes can make money from it. Therefore, it can be stated that there is both a financial and an ethical side.

#### **6) What are the main advantages Novozymes can achieve by getting involved in these activities?**

The main advantages Novozymes can achieve by getting involved into sustainable activities are market advantages, due to the fact that Novozymes can sell more and earn more money. Furthermore, another very important aspect is represented by reputation.

**7) Does Novozymes adopt different strategies in different countries or does it always use the same one to tackle climate change?**

When it comes to the supply chain, Novozymes adopts different approaches. When they supply energy in Denmark, they have a target to supply green energy and this represents the main reason why Novozymes invested in windmills in Denmark.

In China, Brazil and in the U.S., Novozymes has a different approach.

**8) Did Novozymes receive any incentives from the Danish government to adopt policies against climate change?**

No, Novozymes did not receive any incentives from the Danish government to adopt policies against climate change.

**9) What is the next step Novozymes will take?**

There are several steps Novozymes is ready to take to keep being a green and sustainable firm. Considering three steps in the Novozymes strategic journey, its first step was about compliant and risk management and this company did achieve its aims, since Novozymes is on compliant and risks are managed.

The second step is supporting their existing businesses, and that is what Novozymes is taking care of right now. Novozymes is very much supporting its existing business and an element of that is to support Novozymes' sales marketing people with the lifecycle assessment data.

Novozymes' next step will be to generate new businesses based on sustainability due to the fact that Novozymes is exploring the business context; this firm hopes to see where they can use their technologies to provide solution to some of the big problems in the world:

- Water scarcity
- Food scarcity
- Climate change

## 10) How is Novozymes strategic vision formulated? Is it successful?

All the policies started by Novozymes in terms of sustainability represent a success. It makes sense for the firm to keep doing these kinds of strategies for different reasons. Both all the employees and the top managers are very much engaged in these kinds of policies. Having a look to some of the most important sustainability ratings, it can be easily noticed that Novozymes is always rated very high.

An example of an index where Novozymes is high rated is the Dow Jones Sustainability Index<sup>57</sup>. To have the possibility to be included in the Dow Jones Sustainability Indexes, a company needs to show that uses sustainability in a strategic way, integrated with its core business.

Therefore, for all the reasons stated above, Novozymes strategic vision in terms of sustainability can be considered a successful one.

The effort that Novozymes is putting on sustainability has been awarded with the gold ranking as top sustainability performer in the SAM Sustainability Yearbook 2011. Only the top 15% out of 2,500 companies are included in the SAM Sustainability Yearbook. The best performers among these 15% receive the SAM Gold, Silver, Bronze, Leader or Mover Award\_(Dow Jones Index website<sup>58</sup>, 2010).

Novozymes focus on sustainability started already during the end of last decade. This firm managed to achieve the rank of Sector Leader in nine previous years. The fields where Novozymes scored especially higher are the following:

- Environmental dimension
- Stakeholder engagement
- Business ethic

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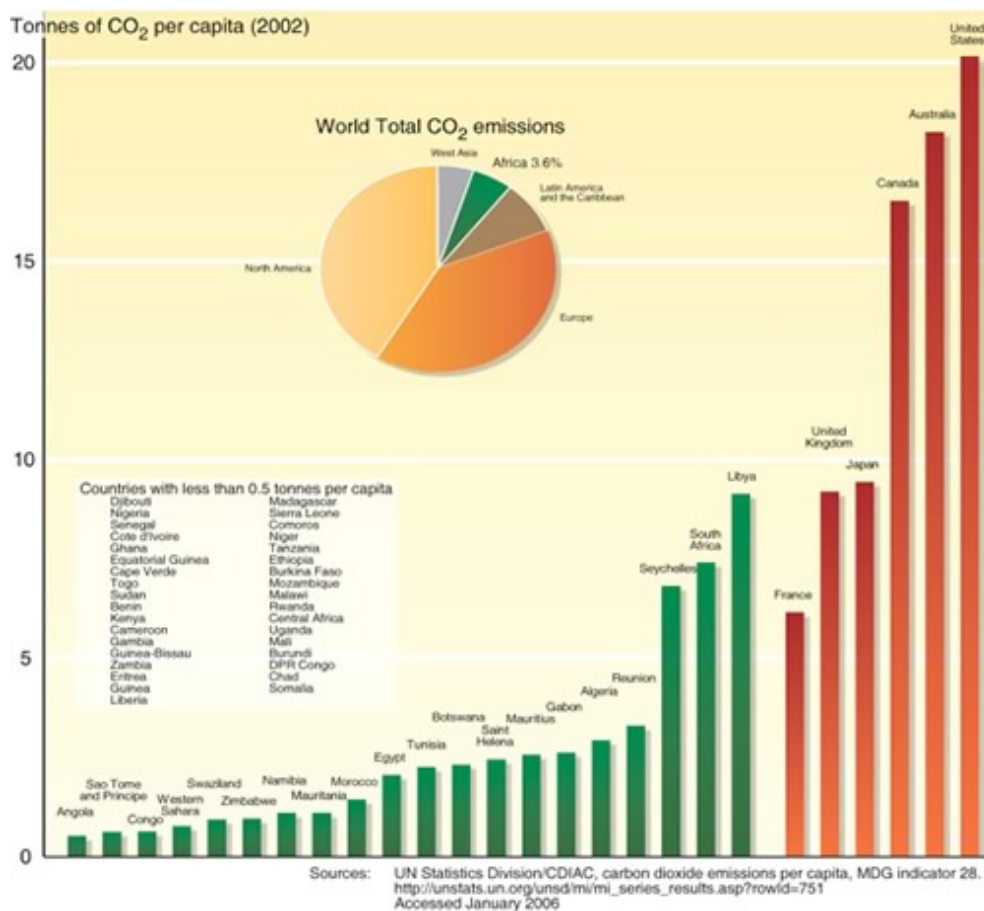
<sup>57</sup> Dow Jones Sustainability Indexes (DJSI): launched in 1999, these indexes represent the first global indexes tracking the financial performance of the leading sustainability-driven companies worldwide. Based on long-term economic, environmental, and social criteria, it captures the top 10% of the biggest 2,500 companies worldwide.

<sup>58</sup> <http://www.sustainability-index.com/>

### Appendix 3: Tones of CO<sub>2</sub> per capita (2002)

The pie chart shows the CO<sub>2</sub> total coming from all the continents while the histogram illustrates more in detail the amount of CO<sub>2</sub> emissions from different countries.

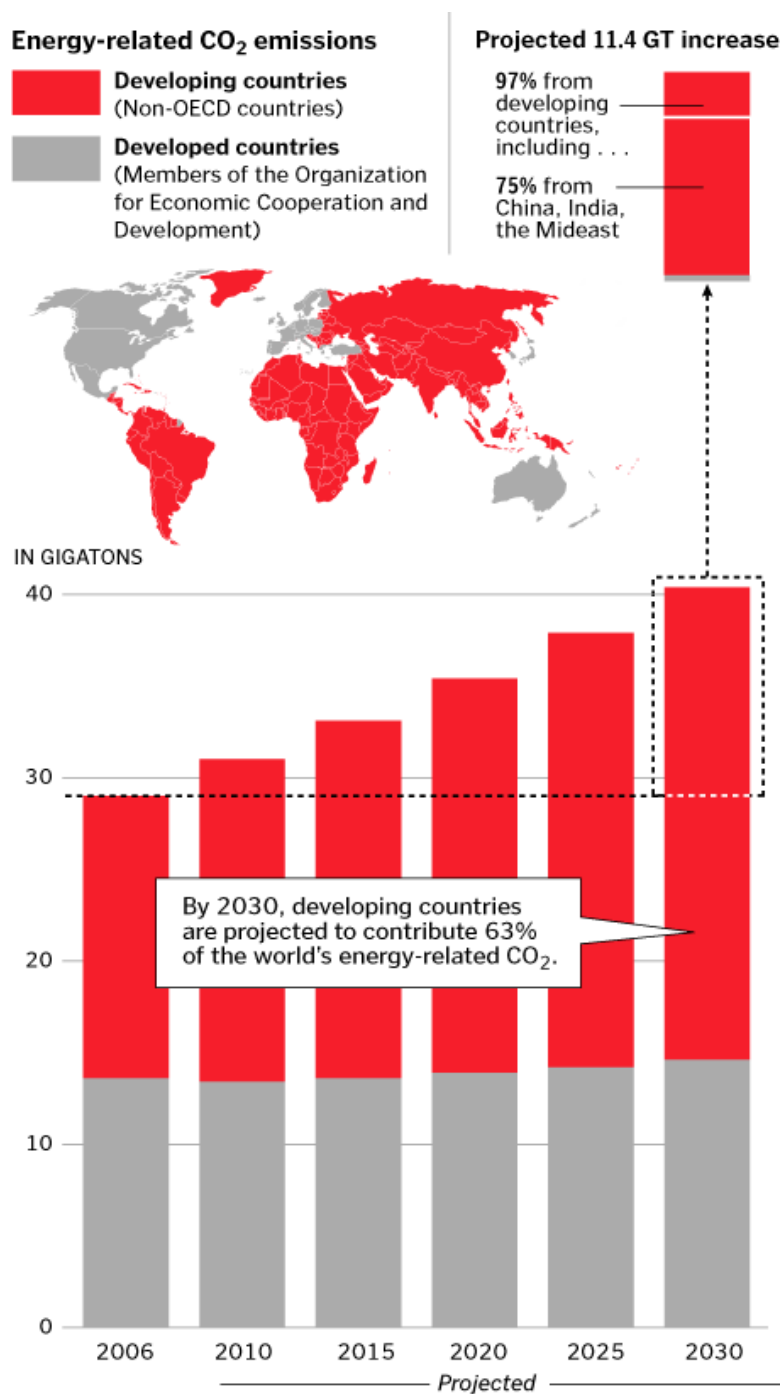
Source: UN Statistics Division, 2006



## Appendix 4: Energy related CO<sub>2</sub> emissions (2009)

This graph illustrates both developed and developing countries energy-related CO<sub>2</sub> emissions. Future projections reveal that CO<sub>2</sub> emissions from developing countries will be higher than the one from developed countries.

Source: Energy Information Administration | The Washington Post (2009)



## Appendix 5: Global Temperature and Carbon Dioxide (2010)

This Graph shows that to a rise of CO<sub>2</sub> levels corresponds an increase in global temperatures.

Source: National Oceanic and Atmospheric Administration, "Global Climate Change Indicators," [www.ncdc.noaa.gov](http://www.ncdc.noaa.gov) (accessed Apr. 13, 2010)

