

Communication about the environmental performance of construction
products

Perception of the French market

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Summary

This thesis was realised in partnership with BASF, the largest chemical company in the world. The aim of the research was to study the perception of the market regarding the environmental performance communication in the construction sector. The objective of BASF in terms of construction products is to combine cost-effectiveness and resource conservation, the reduction of environmental burden and the approach of social aspects at the same time, taking into consideration the technical and the functional requirements.

As far as sustainability is concerned, the requirement is to have evidence-based assessment – not self-declared “green” products. The objective was therefore to identify the perception and the level of knowledge of the target, French architects, of a scientific-based assessment called Environmental Product Declarations (EPD) at a European level or *Fiches de Déclarations Environnementales et Sanitaires* (FDES) at the French level.

In order to conduct this research, a qualitative marketing approach was followed. The thesis first starts with a theoretical framework. Thanks to the information gathered during that phase, we were able to conduct a first qualitative survey in order to have the perception and the knowledge of the French architects. Once the first survey was done, the different themes explored needed to be dig deeper. This is the reason why we decided to conduct a second qualitative survey. It gave us interesting insights as well as enabled us to do a better analysis of the market.

The results showed that sustainability is always assimilated to the ability of the products to last in time. Sustainability is an important criterion that drives architects’ choices even if the best value for money criterion is the main one. In architects’ view, industrials help to move things forward in environmental issues but, for them, several industrials are tempted by greenwashing practices. When it comes to certifications and FDES, those are not well known and their content or purposes are not generally understood. That is why industrials still have an important role to play.

The results allowed us to give practical recommendations and to highlight different aspects in order to enhance BASF sustainability communication strategies in the construction sector.

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Introduction

Today, numerous companies seem to be opting for sustainable development practices due to an increasing demand for quantified environmental information. This trend is characterized by important changes in their strategies and in their communications.

In the present research, we will focus on sustainable construction, the application of sustainable development principles to the construction sector that cover the entire value chain. This sector was selected because the research is realised under the aegis of the BASF Construction Competence Centre established in Waterloo.

Some issues are faced in that sector and BASF has to find new ways to overcome those challenges. Indeed, in the last few years, producers of building materials became increasingly aware on the fact that professionals attached importance to environmental protection through the choice of materials. The growing number of labels and products with environmental labelling or certification is the best example of this situation. In this context, establishing objectives such as Environmental Product Declarations (EPD) could provide clear and accurate information to construction stakeholders about the environmental impacts of the products they use.

The purpose of the research is therefore to identify the perception and the level of knowledge of the target, French architects, of a scientific-based assessment called Environmental Product Declarations (EPD) at a European level or *Fiches de Déclarations Environnementales et Sanitaires* (FDES) at the French level.

To conduct that survey, a marketing approach was followed. The study is divided into four different chapters.

The first chapter is dedicated to the theoretical framework that is split in three different parts: the sustainable development and its emergence, sustainable communication and sustainable practices in the construction sector.

The second and the third chapters will present the two qualitative surveys and their results on the following themes: sustainable construction, construction products choices, environmental performance communications, environmental certifications and FDES.

Finally, the last chapter will focus on a general conclusion, personal recommendations and managerial implications.

Chapter 1: Theoretical framework

The objective of this chapter is to set our study in its context. It will be divided into three different parts. The first part will be dedicated to sustainable development and its emergence. This will enable us to get easily acquainted with this concept and to understand its issues. After that, we will have a look at sustainable communication by introducing the concept of eco-labels and certifications and the use of communication tools in marketing. Finally, we will focus on sustainable practices in the construction sector and more precisely on scientific-based certifications called Environmental Product Declarations.

1. Sustainable development

Currently, the concept of sustainability is one of the most talked about but with no common understanding. Indeed, the meaning of that concept is different by its interpretation and by its superficial treatment. Today, the term can be associated to plenty of domains such as sustainable company or sustainable construction.

In order to get a better understanding of this concept, we will start by a summary of the sustainable development foundations. After that, we will go through the definition of this notion and we will explain the way companies commonly use sustainability as an argument in their strategies.

1.1. The foundations of the concept

For some years now, sustainable development has appeared as a new concept but in reality, it has been a long-standing concern. Indeed, it was at the beginning of the 1970s that the basic notions of sustainable development appeared.

At the time of “The Glorious Thirty”, the premises of concern for the environment already arose in particular with the Club of Rome. The latter came to the conclusion that *“if the economic development is still unchanged in the future, the global system will collapse by the end of 2100 after the depletion of natural resources, overpopulation, food shortages or*

pollution caused by the industrialization¹". The conclusions of Meadows' report were catastrophic for a period of development and economic prosperity. This report outlines the failure to maintain a strong growth and it was not received favourably.

Thereafter, Ignacy Sachs², considered as the father of sustainable development, imagined the eco-development concept (interaction between economy, development and ecology). In 1972, the United Nations Conference on the Human Environment in Stockholm immediately adopted it. It was the first time that we had a global and realistic socio-economic analysis about population development and the use of natural resources.

However, it was in 1987 that the former Norwegian minister, Mrs Gro Harlem Brundtland, published a report called "Our Common Future³" under the aegis of the United Nations. In this report, the first definition of sustainable development is presented. This definition states that we have to ensure today's growth in order to avoid putting in danger the possibilities of growth of the next generations.

In addition, this is also the first time that appeared the first translation in French of sustainable development, "développement durable". It is important to note that this translation is often criticized. By preferring the term "durable" compared to "soutenable" (literal translation of sustainable), the notions of ability to grow "over time" and to develop in a realistic manner were put aside. That is why some analysts prefer the term "développement soutenable".

In 1992, the United Nations Conference on Environment and Development (UNCED), also known as the Earth Summit, was held in Rio de Janeiro (Brazil). This event was of utmost importance because the Member States agreed on the program against global warming, on the protection of biodiversity and the disposal of toxic and hazardous waste. The

¹ Meadows H. & D, R. J. (1972). *The limits to growth : A report for the Club of Rome's Project on the Predicament of Mankind*. . New York: Universe Books.

²Sachs, I. (1978). *Ecodéveloppement : une approche de planification*. In : *Economie rurale*. (Vol. 164). Ecologie et société.

³ Brundtland, G.H. *Our Common Future : report of the World Commission on Environment and Development*. Retrieved 16th April 2014, from: http://conspect.nl/pdf/Our_Common_Future-Brundtland_Report_1987.pdf

wishes of the actors were given effect by signing the Rio Declaration⁴. This declaration enlarges the concept of rights and responsibilities of countries in environmental matters by popularizing the concept of sustainable development. During that conference, the states adopted a program of 2500 actions, called Agenda 21, on the theme of fight against poverty and social exclusion, the production of sustainable goods and services and the protection of the environment.

Later, an international treaty called Kyoto was negotiated in Japan in 1995. Since greenhouses gas emissions are considered to be one of the causes of global warming. During the Earth Summit⁶ held in Johannesburg in 2002, the commitments and perspectives were not up to the challenges. However, this conference that brought together hundreds of heads of states and 4000 representatives allowed reiterating the determination of the Member States to pursue the goals in terms of sustainable development but also to strengthen the partnerships between the North and the South.

Moreover, in parallel with the action taken by the States, other independent actors have brought credibility to the sustainable development approach. The first organism, the World Business Council of Sustainable Development (WBCSD), was created in 1995 with the aim of raising awareness of sustainable development principles and promoting the exchange of good practices between companies. The Global Reporting Initiative⁷ (GRI) is designed to serve as a catalyst whose objective is to help companies in the preparation of their sustainable development reports. In order to achieve this, the GRI published the guidelines applicable for companies. Many different stakeholders such as non-governmental organizations, companies and federations belong to this organization.

⁴ United Nations. (1992). *Report of the United Nations Conference on Environment and Development*. Retrieved 16th April 2014, from : <http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm>

⁵ United Nations. (2013). *Le protocole de Kyoto, un résumé*. Retrieved 17th April 2014, from : http://unfccc.int/portal_francophone/essential_background/feeling_the_heat/items/3294.php

⁶ United Nations. (2006). *Johannesburg Summit 2002*. Retrieved 17th April 2014, from: <http://www.un.org/jsummit/html/brochure/brochure12.pdf>

⁷ Global Report Initiative. (2014). *Homepage*. Retrieved 17th April 2014, from: <https://www.globalreporting.org/Pages/default.aspx>

Kofi Annan, the former UN Secretary-General, launched the Global Compact in 1998. This agreement is a contract by which companies take a moral commitment for the respect and the implementation of the sustainable development principles. In 2000, the OECD published the guiding principles for multinationals that set the rules related to corruption, employment, environment and consumer interests in the countries in which they are based. Finally, in 2001, the European Union published the Green Paper⁸ and it set out principles for a corporate social company.

Nowadays, we can notice the growing involvement of companies leading to increasing capital expenditures in “clean technologies”. That is why the theoretical and conceptual advances around sustainable development were complemented by rules and recommendations in order to be able to make these principles applicable.

1.2. Sustainable development definition

The commonly used definition of sustainable development is the one that appeared in the Brundtland report (1987)⁹. Sustainable development was presented as “*a development that meets the needs of the present without compromising the ability of future generations to meet their own needs*”. This definition puts emphasis on a more careful consumption of non-renewable natural resources and on the responsible environmental stewardship. However, this definition does not tell us what we can and/or must do as well as what we cannot do. It is impossible for us to predict the needs of the future generations but we can try to anticipate them.

In 1992, this concept is modified during the Rio Summit. Indeed, a technical dimension is added by defining the three pillars of sustainable development that are: economic progress, social justice and responsible environmental stewardship¹⁰. Sustainable development is at the crossroads of those three preoccupations as presented in the following figure:

⁸ International Institute for Sustainable Development. (2013). *The European Union Green Paper on Corporate Social Responsibility*. Retrieved 18th April 2014, from: http://www.iisd.org/business/issues/eu_green_paper.aspx

⁹ Brundtland, G.H. *Our Common Future : report of the World Commission on Environment and Development*. Retrieved 16th April 2014, from: http://conspect.nl/pdf/Our_Common_Future-Brundtland_Report_1987.pdf

¹⁰ United Nations. (1992). *Report of the United Nations Conference on Environment and Development*. Retrieved 16th April 2014, from : <http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm>

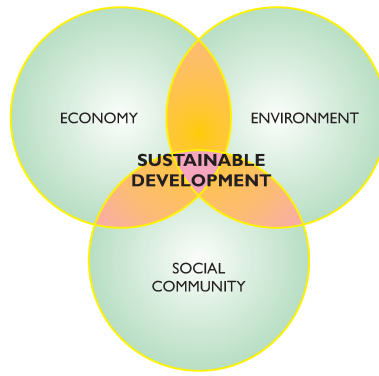


Figure 1: The three pillars of sustainable development

This figure highlights the three dimensions of sustainable development that are:

- **Environmental dimension:** sustainable development is often reduced to that dimension. It is true that for developed countries, environment is one of the major concerns. We consume too much and we produce too much waste. It is our responsibility to fight against harmful actions in order to preserve our ecosystem, our biodiversity and the fauna and flora.
- **Social dimension:** sustainable development aims at fighting against social exclusion, giving general access to goods and services, decent working conditions, an improvement of employees training and enhancing their diversity and the development of fair and local trade.
- **Economical dimension:** the economy is an important pillar in our consumer society. Sustainable development implies modifications of our production and consumption model by taking action to prevent that the economic growth is not made to the detriment of the environment and the social dimension.

In this representation of the three pillars of sustainable development, we can notice that this view may involve different concepts according to its areas of use. Furthermore, it must be emphasized that behind those simple concepts that represent goals to be achieved, the means used can take numerous forms.

This very conceptual sustainable development definition is applicable to the whole society. That is why it is important to add the definition stated by D. Stephany¹¹. According to this author, the performance measurement of a company cannot be achieved solely from an economic point of view but also needs to integrate a more holistic approach. He defines the conceptual framework of sustainable development in companies as follows “*sustainable development consists to ensure the development by considering a global approach of the performance. This performance should be maintained over time, resistant to change, respectful of a value system and involve external and internal stakeholders with a perspective of continuous progress*”.

Regarding those definitions, we can see that sustainable development is a broad concept. That is why the will of the international community is to get involved in sustainable development through laws and regulations at different levels.

For example, as we saw above, the Kyoto protocol sets specific targets at the international level regarding greenhouse gas emissions. This is reflected at the Community level through a carbon dioxide emission permit allocated to companies.

However, most of the actions in regards to sustainable development are based on voluntary commitments and are not sanctioned in case of non-compliance.

In addition, the symbolic absence of the United States, the world’s leading power and the biggest polluting country of those that ratified the Kyoto protocol, shows the limits of these international treaties.

At the national level, the publication of sustainable development reports obliged companies to define their strategies regarding that subject.

¹¹ Stephany, D. (2003). *Developpement durable et performance de l’entreprise*. Pairs. Editions Liaisons.

1.3. Sustainable development: growth leverage for companies

Sustainable development has often been considered as a constraint for companies. However, an increasing number of managers see sustainable development as growth leverage for their company.

The growth that they will consider is a mid or long term one even if there are an important number of short-term expectations. In addition, results and returns start to be visible at the mid-term period. That is why it takes a few years for a company to integrate sustainable development into its growth strategies.

Sempels and Vandercammen (2009) affirmed that the particularities of this growth are its multicriteria and qualitative factors. Profit continues to be the key objective for companies because it ensures their economic viability. Sustainable development integrates different perspectives. The quest for profit is not limited to its economic performance. The social and environmental dimensions should now be part of the strategy. Growth is not just a short-term profit. The profit consists of the global performance of the company that embraces diverse objectives that match to stakeholder's expectations¹².

For decades, innovations have been continuously multiplied without any thinking about the social dimension. But sustainable development should be based on creation processes inspired by a future desire and not by technical and commercial viability.

With sustainable development, it is no longer innovation for the sake of innovation but innovation for the welfare of the society¹³. Companies should have a critical opinion regarding innovations. The benefits gained from progress should be higher than the social costs that it generates. In that sense, investment in research and development is fundamental because it is the flagship for tomorrow's solutions such as clean energy for example. Future generations will find their interest only in the long-term strategy of companies.

¹² Vandercammen, M and Sempels. (2009). *Oser le marketing durable : concilier marketing et développement durable*. Pearson Educations France.

¹³ Vollenbroek, A. (2002). *Sustainable development and the challenge of innovation*. Journal of Cleaner Production. Volume 10, Issue 3, June 2002, Pages 215

Companies want to express concerns about sustainable development with the concept of corporate social responsibility.

1.4. The emergence of the concept of social responsibility in companies

The concept of sustainable development has not been created for companies, it is by definition a global society project and each individual at his own level should be an actor of change¹⁴. At the present time, companies should take responsibility for their own actions as well. The term used to pursue the objective of sustainable development by companies is Corporate Social Responsibility (CSR).

The Corporate Social Responsibility (CSR) does not only examine the economic dimension but also takes a look at the situation of the company in the society and at its contribution to the social life. The European Commission defines the CSR as “*a concept whereby companies integrate the social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis*”¹⁵. The aim is to ensure the optimal management of human, financial and natural resources to meet the society needs by having a responsible behaviour for the products and services produced.

The Corporate Social Responsibility requires that firms reassess their business model and their strategies by including environmental issues such as climate change, social issues, diversity or human right respect while having good governance rules¹⁶. In other terms, a company should not only consider its profitability or its growth but also environmental and social issues. It concerns both multinational companies and SMEs but takes different forms sector by sector.

¹⁴ Dale, A. and Robinson, J. (1996). *Achieving Sustainable Development*. UBC Press.

Ottman, J.A. (2010). *Green Marketing: Challenge and Opportunities for the New Marketing Age*. Hardcover

¹⁵ EU Business. (2006). *Corporate Social Responsibility in the EU*. Retrieved 20 April 2014, from:

<http://www.eubusiness.com/topics/social/corporate-social-responsibility-in-the-eu/>

¹⁶ Arjalès, D-L. and Péan, J-M. (2009). *CSR : a new business model for multinational companies ?* Retrieved 20th April 2014, from :

http://www.economie.polytechnique.edu/servlet/com.univ.collaboratif.utils.LectureFichiergw?ID_FICHER=1265647883119&ID_FICHE=55100

A company with a CSR policy takes into account all its economic and social partners such as clients, suppliers, and employees but also the local community¹⁷. All those actors are considered as stakeholders. It is important to not make the confusion with the shareholders, who are part of the stakeholders and whose interest is to focus on the financial results of the company.

The corporate citizenship fundamental principle is to put the entire activity of the company for the benefit of the life of the community in which it operates while taking into account the profitability for stakeholders. Each company committed to a CSR approach follows its own convictions.

According to Sempels and Vandercammen¹⁸, there are two conditions for a sustainable growth. First, there is a need for greater awareness on behalf of companies. Indeed, businesses must take their major responsibility in the promotion of sustainable development and must not curb their development. The second condition is the integration of social and environmental concerns in their business strategies. It is important to have a critical thinking on social and environmental issues.

However, the short-term economic pressure puts a brake on those initiatives. It is not evident to combine economic pressure in the short-term and the long-term community expectations.

Sustainable development has become a major issue for each company¹⁹. Concerns are currently omnipresent in the companies' strategies and policies. The evolution of management towards environmental practices is initiated. Each department of a company needs to adapt itself to new realities. That is also true for the marketing department. Sustainable communication and green marketing are now part of companies' strategies.

¹⁷ Hopkins, M. (2003). *The Planetary Bargain – CSR Matters*. Eartscan : London

¹⁸ Vandercammen, M and Sempels. (2009). *Oser le marketing durable : concilier marketing et développement durable*. Pearson Educations France.

¹⁹ European Bank for Reconstruction and Development. (2008). *Sustainable Development and Corporate Responsibility*. Retrieved 21st April 2014, from: <http://www.ebrd.com/environment/e-manual/e14ethic.html>

2. Communication and sustainable development

Many different companies are on the road towards sustainable development and corporate responsibility. For them, the challenges are also key issues for communication. From marketing to advertising, from corporate communication to education campaign, the message of sustainable communication is being increasingly claimed by companies.

The relations between corporate communication and sustainable development have never been easier²⁰. Indeed, sustainable development is part of the communication process and was rapidly used by communication actors because it redefines the role, the responsibilities and the relations of a company.

The corporate communication covers the operations of communication that aims at strengthening the image of a company and not directly its products or services. The CSR is about creating an image of a responsible company. The CSR communication is based on the long-term and on the social and environmental practices of a company or on the dialogue with stakeholders²¹.

The integration of responsibility into a communication has become essential. Having a more ethical or more sustainable speech than the competitors does not mean having a better image. To do this, you also need to be able to communicate.

Businesses must now be prepared for the integration of environmental communication in their business model. The communication policy raises numerous issues because it allows companies to strengthen their image by an argumentation on a public concern as well as demonstrating the environmental products performance.

²⁰ Pratt, M. (2006). *Sustainable Computing: It's not easy being green*. Retrieved 22nd April 2014, from: http://www.computerworld.com/s/article/109629/Sustainable_Computing_It_s_Not_Easy_Being_Green?taxonomyId=14&pageNumber=3

²¹ Stanaland, A. and Murphy, P. (2011). *Consumer Perceptions of the Antecedents and Consequences of Corporate Social Responsibility*. *Journal of Business Ethics*, 102, 47-55

Today, product differentiation is one of the main elements of a marketing strategy. Several companies therefore perceive responsible or green marketing as an opportunity that must be grabbed.

2.1. Through a Green Marketing

As previously mentioned, sustainable development is becoming increasingly important for companies. In that sense, companies have turned to a more “sustainable” marketing. The awareness and the education of the consumer to evolving practices are crucial.

As far as history is concerned, the Green marketing, also known as environmental marketing or sustainable marketing²², is different from the traditional marketing by its components. We will call Green Marketing all the actions aimed at using green (sustainable) arguments and benefits to brand or product positioning²³. This will have an impact both on the image of the company and on sales.

The real added value is the decrease in environmental impacts compared to other products or services available on the market. By sustainable benefits, we mean improvement at different steps of the life cycle. These improvements might involve the purchase of raw materials, the production process and the recycling of product components such as the packaging for example. We will therefore refer to green products.

The Green Marketing has different purposes. First of all, it offers the possibility to communicate on products or services in order to change the consumer’s habits²⁴. For example, it could explain to a consumer how a better use of the product can have an impact on the energy consumption. In addition, the Green Marketing can help to change the way people perceive the world by targeting their consumption patterns and their lifestyle. Finally,

²² Pride and Ferrel (1993). *Marketing: Study guide*. Houghton Mifflin.

²³ Sarkar, A. (2012). *Green marketing and sustainable development – Challenges and Opportunities*. International Journal of Marketing. Vol 1 Issue 9.

²⁴ Kotler, P. (2011) *Reinventing Marketing to Manage the Environmental Imperative*. Journal of Marketing: July 2011, Vol. 75, No. 4, pp. 132-135.

the Green Marketing allows producers or distributors to communicate on their adaptation efforts to the environment's constraints²⁵.

The majority of consumers are unaware of the environmental impacts of the products they use and do not seek further information. It is therefore the responsibility of companies to inform them. The education should be internal and external of the company. The message will circulate better if it is understood internally but for now it is not always the case²⁶.

Several tools are available on the market for the purpose of informing the public on the company commitments and responsibilities toward the environment. Those tools can take the form of labels or certifications for example. In addition, from a market perspective, enhancing competition makes the use of labels attractive to differentiate products as well as showing skills and commitments to an environmentally friendly awareness.

2.2. Environmental Labels and certifications

To confirm their investments in sustainable development practices, companies should provide transparent and accurate information to the society. Indeed, consumers have a lack of sufficient analytical elements necessary for their assessment²⁷. In addition, they are often driven by stereotypes and ignore the legislation and requirements. They have greater confidence in what they can see or measure and do not pay much attention to specific details. Labels and certifications can give way of being a reference in terms of quality. It therefore provides an objective control by the global approach of sustainable development.²⁸

However, without stricter and more controlled regulations, sustainable development labels and certifications might confuse the real quality of a product or a service in terms of sustainable development.

²⁵ Ottman, J.A. (1992). *Industry's response to green consumerism*. Journal of Business Strategy, 13(4), 3-7.

²⁶ Ottman, J.A. (2010). *Green Marketing: Challenge and Opportunities for the New Marketing Age*. Hardcover.

²⁷ Ministère de l'écologie, du développement durable et de l'énergie. (2013). *Affichage Environnemental des produits de grandes consommations*. Retrieved 24th April 2014, from: http://www.developpement-durable.gouv.fr/IMG/pdf/Affichage_environnemental.pdf

²⁸ Vandercammen, M. (2007). *The impact of labeling on CO2, reduction, Product Labeling for sustainable consumption, conférence au NEIPM*.

In the light of this, labels and certifications that are used need to be regulated. A label or a certification should²⁹:

- Guarantee an added-value in accordance with sustainable development principles
- Be delivered by an independent third party that controls a priori and a posteriori products and services having a certification or a label
- Meet transparent specifications that are recognized and submitted to the control of an accredited organization
- Be easily identified and understandable by the consumer
- Provide clear and accurate information on the real added value of the product or the service.

2.2.1. Eco-labels

Environmentally friendly labels are called eco-labels. Their criteria ensure a functional quality of the product or service as well as a reduction of its environmental impact in its whole life cycle.

The aim of an eco-label is “...to raise consumer awareness about the environmental effects of products, to inform consumers about the environmental characteristics of a product and to promote the adoption of more environmentally sound production methods and technology³⁰” (Lehtonen 1997). It is a good mean to help differentiation among products, to provide reliable information and to reduce informational asymmetries.

- **Product Differentiation**

Labels are part of a tradition that sellers have developed in order to assure the buyers the authenticity and quality of their products and services. As Joop de Boer³¹ says, “it is sort of

²⁹ Vandercammen, M., (2007). *Des attentes des consommateurs au devoir de contrôle des fournisseurs de farine des boulangers*, Luxembourg.

³⁰ Lehtonen, M. (1997). *Criteria in environmental labeling: A comparative analysis of environmental criteria in selecting labeling scheme*. UNEP.

³¹ De Boer, J. (2003). *Sustainability labelling schemes: The logic of their claims and their functions for stakeholders*. Business Strategy and the Environment, Vol. 12, pp.

insurance in the marketplace. It reveals the difference between sustainable and less sustainable methods, which buyers might not be aware of but which they could not identify in the market". We can agree that the labelling of products or services is one of the means a company can use to improve its competitive position in the marketplace.

Consumers do not have the ability to judge if a product is more environmentally friendly than another because they do not have enough knowledge to make that judgement. In the meantime, consumers are able to pay a premium in order to have those unobservable characteristics (Bjørner et al., 2004³²). The marketers therefore use it as a mean of differentiation. It has the advantage to provide more specific information to the consumers about the environmental impact of the product or the service.

For Schumacher³³, an eco-label is a mean to help the product differentiation, providing reliable information and reducing informational asymmetries³⁴.

- **Reliability of the information**

The substantial increase in the number of eco-labels put the quality and the reliability of the information in dispute (see e.g. Van Amstel et al., 2008³⁵). This makes it difficult for consumers to fully take advantage of eco-labelling.

The key problem is that eco-labels have numerous different quality standards and criteria. Thus, it should not be a surprise that their reliability and informational content have repeatedly been called into question. In a recent study that analyses eco-labels, Van Amster et al (2008)²⁹ conclude "*main shortcomings of the eco-labels were found in their ambiguity about environmental themes, their failure to assure the buyer about the product's ecological impact and the insufficient information about producers' compliance*". For example, some eco-labels take into account the entire product's life cycle while some others only underline

³² Bjørner, T., Hansen, L., Russell, C. (2004) . *Environmental Labelling policies, and regulatory enforcement*. Environmental & Resources Economics 37 (2), 411-430.

³³ Schumarcher, I. 2010. *Ecolabeling, consumer's preference and taxation*. Ecological Economics.

³⁴ Schumarcher, I. 2010. *Ecolabeling, consumer's preference and taxation*. Ecological Economics.

³⁵ Van Amstel, M., Driessen, P., Glasbergen, P. (2008) . *Eco-labeling and information asymmetry : a comparison of dive ecolabels in The Netherlands*. Journal of Cleaner Production 16 (3), 263-276.

particular and specific aspects and do not capture some important product characteristics. It is important to have more reliable eco-labels and this in a limited number.

- **Reducing informational asymmetries³⁶**

The main purpose of eco-labels is to reduce the informational asymmetries between consumers and producers regarding the environmental features of the product or the service. (Crespi & Marette, 2005³⁷; Leire & Thidell, 2005³⁸). Asymmetries exist because consumers are not present and involved in the production phase of the product. Consumers cannot therefore measure its environmental impacts.

Eco-labels can be a solution to diminish that asymmetry. However, some companies and businesses are tempted to use eco-labels and environmental information only for a marketing purpose without taking concrete actions.

2.3. Greenwashing³⁹

Increased awareness about social and environmental impacts by the society, politics and companies is encouraging and positive. But, as it is often the case, there is a risk to fall into a “fashionable phenomenon”. Today, it is a good strategy for companies to display their green and social values or to introduce themselves as engaged and responsible actors whereas in reality they do not do anything in that sense.

Greenwashing refers to a certain type of marketing communication that is used to *misleadingly promote the perception that an organization's products aims are*

³⁶ Delmas M., & Lessem, N. (2013). *Saving power to conserve your reputation? The effectiveness of public versus private Information, (Working Paper)*. Los Angeles: UCLA Institute of the Environment.

³⁷ Crespi, J. M., & Marette, S. (2005). *Eco-labelling economics: Is public involvement necessary?* Environment, information and consumer behavior (pp. 93-110).

³⁸ Leire, C., and Thidell, A. (2005). *Product-related environmental information to guide consumer purchases— A review and analysis of research on perceptions, understanding and use among Nordic consumers*. Journal of Cleaner Production, 13, 1061-1070.

³⁹ Futerra Sustainability Communication. (2009). *The Greenwash guide*. Retrieved 25th April 2014, from : http://www.futerra.co.uk/downloads/Greenwash_Guide.pdf

*environmentally friendly*⁴⁰. This type of communication gives to the society a responsible image of the company or a brand whereas the real actions in favour of the environment do not correspond to what is communicated.

There are different types of greenwashing communication. Hereinafter we will focus on labels, packaging and communication.

- **Labels**

The labels that we are considering are « Type 2 ⁴¹ » environmental labels because they are considered as environmental self-declarations. Self-declared labels are a mean for companies to deceptively promote their environmental efforts and to win wide public acceptance. Self-declared labels are not necessarily a mean to put forward greenwashing practices. Even if some rules have to be followed, it is not easy for the consumer to check the validity of the information provided. That is why a company may be tempted to use that tool to mislead the consumer.

- **Packaging**

Greenwashing can be found on packaging when a company decides to change its colour and uses the green colour in an abusive way, by adding environmental pictures and by using unjustified eco-labels. Being environmentally friendly does not only imply the presence of green or pictures on the packaging. A reduced format accompanied by environmental effort without altering product components is even better⁴².

- **Communication and advertisement**

Several companies are also tempted by improper disclosure of information. Greenwashing is present in the advertisement of non-environmentally friendly companies or

⁴⁰ Benoit-Moreau F., Larceneux F. et Parguel B. (2009). *Comment prévenir le Greenwashing ? : L'influence des éléments d'exécution publicitaire*. Management : Tensions d'aujourd'hui, 365-376

⁴¹ Bartenstein, K. and Lavallée, S. (2004). *L'écolabel est-il un outil du protectionnisme vert*. Série Scientifique.

⁴² Direction générale des politiques internes de l'union - Département thématique A : Politiques économiques et scientifiques (2012). *Pratiques trompeuses en matière d'emballage*. Parlement européen, PE 475.081, page 3

in company releases or sponsoring⁴³. For example, providing financial support to an environmentally friendly project can be seen as greenwashing if the contributor does not respect the environment in its daily activities.

Companies have therefore developed their communication to hide greenwashing or to nuance their commitments. Advertisers now underline their claims thanks to accurate figures in order to support their speeches or subtly change the terms employed. “An ecological car” becomes a “greener car”. With that nuance, companies are trying to avoid those practices.

3. Sustainable development and construction sector

3.1. Sustainable construction

In few years, sustainable construction went from an emerging practice and an alternative to an essential part of the 21st century buildings. While this statement is simple, the challenge is a big one for construction actors.

In this section, we will see how sustainable development took a growing importance in the construction framework.

3.2. From sustainable development to sustainable construction

This recent designation of sustainable development grew from the approximation of the principles of sustainable development⁴⁴ (Brundtland declaration 1987) and from all the approaches developed in the nineties. During decades, the buildings and the fact that they are sustainable or not have been a non-question. The reason is simple: the demographic conditions and environmental issues were not obvious and did not justify a questioning of the construction methods even in the broad sense of energy and resources usage.

With the progress, human activities, or the demographic growth and the increasing demand for resources, started to increasingly ask for quality and quantity in resources and in energy. This has a direct impact on the environment. It is not new, but the use of sustainable

⁴³ Evrard, S. (2008). « *Le Greenwashing outil dangereux* ». *Get up*, 4, 27

⁴⁴ Brundtland, G.H. *Our Common Future : report of the World Comission on Environment and Development*. Retrieved 16th April 2014, from: http://conspect.nl/pdf/Our_Common_Future-Brundtland_Report_1987.pdf

development practices in environmental or energy arguments as well as its complexity are now part of the strategic marketing argument (especially for raw material producers, contractors, design offices, clients/consumers and environmental associations).

The desire to make the construction sustainable was developed in a context of growing awareness of the industrial development processes threats and the question of energy dependence (from national economy to individual level). The desire is driven by our better knowledge of the environmental impact of construction (in particular the energy level or resources consumption).

All of this has been possible thanks to the development and the progress of scientific knowledge and to the techniques of design, construction and measurements of the impacts. The quality of the implementation of a construction needs to be higher for a well-insulated house because the risk of having problems (bad air quality, condensation or thermal bridges) is multiplied.

The opportunity to contribute to a sustainable construction has also been developed at the political level. The context is the increasing price of energy and our dependency to energy and to oil companies. In fact, this aspect played a more important role in the success of initiatives praising energy saving or energy efficiency in comparison to the “environmental values” and the “the environmental good sense”.

Ecologists have thought of the links between construction and environment for about fifty years. They were the first to initiate this kind of reflections. Were they alone or in “networks”, they developed alternative methods of construction (materials used, techniques, comfort or energy) that were compared to industrial ones, which were considered as polluting.

The use of natural/ecological materials, the use of local and abundant resources and the application of a “good ecological and economic sense” advocated by ecologists put in evidence the simple and obvious features of a construction more respectful of the environment. Contrary to what we think, those approaches are usually accompanied by a questioning of the existing living practices, the consumption and the behaviour regarding

energy. We can summarize this approach by stating the concept of “simple living” that means “*voluntary practices to simplify one’s lifestyle*⁴⁵”.

The reduction of energy consumption was not the main goal of those “non-conventional” builders. Indeed, they highlighted the natural or biological features, the health benefits, the proximity and the low cost of materials as well as the ease and speed of the technique, in particular for non-professionals.

Later, indicators, tools and concepts developed by experts and scientists such as the life cycle analysis or the ecological footprints applied to construction products have better quantified the environmental quality. It helps us state that those tools deserve particular attention today.

3.3. The three pillars of sustainable construction

Sustainable construction is the application of sustainable development along the construction value chain. It is a condition for a long-term success. This is a holistic approach of the three pillars of sustainable development as defined by ISO 15392⁴⁶ :

- **Economical dimension:** “...*particular aspects of the construction works, parts of works, processes or services related to their life cycle, can interact with economic impacts, or economic legacy, which extends beyond the life of the construction works. These relate to costs and benefits that measure the impact to the economy, wholly or partially resulting from activities, products or services used in the construction work or in the use of the construction works. Besides direct and short-term economic considerations, economic aspects incorporate life cycle considerations that measure the long-term economic impacts, or economic legacy....*”

⁴⁵ Duane, E . (1993). *Voluntary simplicity: toward a way of life that is outwardly simple, inwardly rich*. Rev. ed. New York: Quill, c1993. 240 p

⁴⁶ International Organization for Standardizations. (2008). *ISO 15392: Sustainability in building construction – General principles*

- **Environmental dimension:** *“...particular aspects of the construction works, parts of works, processes or services related to their life cycle, can interact with the environment. These relate to current use of the earth’s resources; consider impacts on the quality and the quantity of resources as well as local, regional and global ecosystems; and incorporate life cycle assessment to evaluate the impact to the environment, wholly or partially resulting from activities, products or services used in the construction work or in the use of the construction works. This should include any legacy left by the construction works...”*
- **Social dimension:** *“...Particular aspects of the construction works, parts of works, processes or services related to their life cycle can interact with society or quality of life. These relate to intergenerational ethics (impact upon future generations) and recognize the inherent value of ecosystems, traditions and cultures. Impacts to society or quality of life, wholly or partially resulting from activities, products or services used in the construction work or in the use of the construction works involve impacts on local culture and the provision for basic human rights and human needs, and should include any legacy left by the construction works...”*

Thanks to good technical performances and sustainable functionalities, the construction product should not be prematurely replaced. It will allow avoiding additional impacts on the environment. In that manner, a good technical performance and sustainable functionality also contribute to sustainable development and the three pillars that traditionally define it.

3.4. Environmental labelling in the construction sector

Today, industrials try to integrate the holistic approach of the three pillars and communicate their commitments in their marketing strategy thanks to several tools such as labels or certifications. It helps them to provide a more credible and accurate information regarding their actions in favour of the environment.

The environmental labelling is considered as a proof of compliance with specifications without requiring further evidence and the ISO 14024 governs it. This label can be considered as a communication tool for the architect, the contractor or the project manager.

The material producer puts in evidence the great environmental strengths of a product or a service.

There are different possibilities to make all construction professionals sensitive to technical aspects and help them in their choices of sustainable products such as legal obligations or regulations and voluntary initiatives in the form of certifications and labels⁴⁷. So as to make construction professionals and contracting owner sensitive to those environmental aspects and drive their decision process, three types of voluntary environmental declarations (types I, II and III) exist for the construction products.

The International Organization for Standardization (ISO) has defined three different types of Voluntary Environmental Performance Labelling. Those environmental declarations are sort of “allegations” that represent environmental aspects linked to a product or a service. As specified in the ISO 14020:2000, “*environmental labels and declarations shall be accurate, verifiable, relevant and not misleading*”⁴⁸.

Those environmental labels and declarations are developed as an environmental communication tool based on standards. However, we have to make the distinction between the three different types (I, II, III).

- **Type I environmental labelling**⁴⁹

Type I environmental labelling can be operated on a voluntary basis by public or private agencies. In accordance with the ISO 14024, “...*voluntary multiple-criteria-base third party program that awards a license which authorize the use of environmental labels on products indicating overall environmental preferability of a product within a particular product category based on life-cycle considerations*”⁶...”. The proof of conformity of the product

⁴⁷ Centre Scientifique et Technique de la Construction. (2007). *Critères de choix des matériaux durables*.

Retrieved 27th April 2014, from: <http://www.cstc.be/homepage/index.cfm?cat=publications&sub=bbri-contact&pag=Contact13&art=196>

⁴⁸ International Organization for Standardizations. (2000). *ISO 14020: Environmental labels and declarations – General principles*.

⁴⁹ International Organization for Standardizations. (1999). *ISO 14024: Environmental labels and declarations – Type I environmental labeling – Principles and procedures*.

through criteria followed by labels can be demonstrated by the Life Cycle Assessment (see topic LCA) or by other methodologies.

The purpose of those labels is to determine a product that, compared to other products in the same category, has a lower impact on the environment. Moreover, the periodic revision of the criteria allows a continuous improvement of environmental features of labelling products⁵⁰.

The main benefit of those labels is their reliable and simple (not too many details) illustration of the good environmental performance of the product. Therefore, they are frequently applied to products for which the buying-decision is quite fast.

Their main disadvantages are:

- The number of product category with already existing criteria is limited.
- A high number of products and services cannot pretend to the label yet because of its voluntary nature. It cannot certify that the labelling product is the most ecological one of its category.

Here you can have a quick overview of some well-known environmental labels used in Belgium for materials and construction products:

- ✓ Europe: EU Flower
- ✓ International: NaturePlus
- ✓ Cradle-to-Cradle
- ✓ National: Der Blaue Engel
- ✓ Nordic Swan

⁵⁰ Global Ecolabeling. (2004). Introduction to Ecolabeling. Retrieved 28th April 2014, from: http://www.globalecolabelling.net/docs/documents/intro_to_ecolabelling.pdf

- **Type II: Self-declared environmental claims**⁵¹

Type II environmental declarations called “self-declared” comprises declarations made by the distributor or producer of the product itself without any control from a third party. Those environmental declarations therefore benefit from a low rate of credibility. Moreover, the information value is usually limited because it concerns only one single environmental aspect like, for example, the proportion of recycling material (see example). The ISO 14021 describes the frequently used terms in declarations such as recycling⁵².

- **Type III Environmental Product Declaration (EPD)**

Type III Environmental Product Declaration (EPD) includes detailed, quantitative and verified information about environmental aspects. Required information are delivered voluntarily by the producer or the distributor of the product, based on the Life Cycle Assessment and may contain additional information in terms of environment. An independent third party ensures the verification of the information provided⁵³.

The environmental labels we will focus on for the purpose of this study will be the Environmental Product Declaration (type III). The reason for choosing those ones that is scientific-based information about the construction product in its whole life cycle is provided. EPDs are different compared to other types such as type 2 because they count on more transparency and credibility thanks to a scientific approach.

3.5. Environmental Product Declarations

Currently, there is an often-misleading claim about the environmental profile components when it comes to manufacturing environmentally sustainable products. No matter the industry or the product, there is an increasing market demand and a need from manufacturers,

⁵¹ International Organization for Standardizations. (2000). *ISO 14021: Environmental labels and declarations – Self-declared environmental claims (Type II environmental labeling)*.

⁵² Palerm, J. (2000). Guidelines for Making and Assessing Environmental Claims. Retrieved 27th April 2014, from : http://ec.europa.eu/consumers/cons_safe/news/green/guidelines_en.pdf

⁵³ Environdec. (2014). *Homepage*. Retrieved 1st May 2014, from : <http://www.environdec.com>

architects, designers and purchasers for objective and unbiased environmental information that make easier the comparison between products⁵⁴.

An Environmental Product Declaration (EPD) is a tool that provides environmental data on products and services based on the life cycle assessment (LCA) and other relevant information in accordance with ISO 14025 standards (Type III Environmental Declaration). It evaluates the environmental impact of products and offers an effective framework for the buyer by easing direct product comparison between similar products. In the last years, EPDs have become increasingly important and functional on the market of several countries. EPDs are defined by the ISO 14025 and give the possibility to communicate clear, credible and precise information that make products comparisons efficient and effective⁵⁵. It leads to providing more informed purchasing decision by telling with confidence about a product's safety and performance. No matter their position or use in the production process, EPDs are used to allocate the products in well-defined groups facilitating direct products comparisons.

There are a few ways in which EPDs can be used⁵⁶:

- As a **communication** tool to offer verifiable and detailed environmental information of the product in order to improve its environmental impact awareness
- As a **management** tool to improve the environmental performance by using and monitoring data
- As an **assessment** tool to manage comparative analysis of environmental information and to assess the decision-making of the product selection
- As a **procurement** tool to meet government, institutional or environmental objectives
- As an **action** tool to encourage the demand and supply for environmental products.

EPDs are important tools for producers because they provide a verified and quantitative description⁵⁷ about the environmental performance of products in a life cycle perspective. For

⁵⁴ Environdec. (2014). *What is an EPD?* Retrieved 1st May 2014, from : http://www.environdec.com/en/What-is-an-EPD/Why-EPD/#.U2USPK1_v0B

⁵⁵ International Organization for Standardizations. (2006). *ISO 14025: Environmental labels and declarations – Type III environmental declarations – Principles and procedures*.

⁵⁶ Environdec. (2014). *Communicating Environmental Product Declarations*. Retrieved 1st May 2014, from : http://www.environdec.com/Documents/Other%20documents/Communicating_EPDS_brochure.pdf

those producers who define EPDs and provide the information to the market, the advantages are⁵⁸:

- **Objective:** the standards and methods used in the life cycle assessment (LCA) are internationally and scientifically accepted. (ISO 14040/14044)
- **Neutral:** there are no valuations and predetermined environmental performance that should be met.
- **Flexible:** the content can be changed or improved when it is required by the company/organization after external review or verification.

Thanks to factual and verified information, there are also advantages for consumers that use EPDs as a source of information. The latter can be used for various purposes. The information is:

- **Comparable:** Through the Product Category Rules (PCR) for selected products and services, the information is gathered and calculated on international and harmonized calculation rules.
- **Credible:** an independent verifier makes the critical review, the approval and the follow-up.
- **Continuously updated:** the routines documentation and follow-up procedures requirements.

One of the disadvantages of EPDs is that those elements are totally based on a life cycle assessment. They can thus be a burden for the producer or the distributor. The breadth and the complexity of those information mean that they can only be interpreted or used by specialists and not by a non-informed individual. Finally, the requirements are not the same from an EPD system to another in such way that the comparison of the results is not possible yet.

⁵⁷ International Organization for Standardizations. (2006). *ISO 14025: Environmental labels and declarations – Type III environmental declarations – Principles and procedures*.

⁵⁸ Environdec. (2014). *What is an EPD?* Retrieved 1st May 2014, from : http://www.environdec.com/en/What-is-an-EPD/Why-EPD/#.U2USPK1_v0B

In short, an EPD provides an easy access to verified information, the possibility to make fair judgments and a provision of other relevant information in an international common reporting format that offers a wide range of communication possibilities.

3.5.1. EPD content⁵⁹

As stated in the latest point, an EPD can look different from one to another. However, the information normally present in the EPD should include the same parameters and the following different elements:

- Description of the company
- Description of the product/material
- Components/materials of the product
- Additional Information (optional) such as the manufacturing/the assembly, sustainability of the cost of the life cycle
- Life-cycle Analysis.

Since the EPD should contain the latest information and data, there is therefore a possibility to correct and update the information on the documentation. However, an independent third party has to confirm the change in notification.

3.5.2. Conclusion of EPD

This set of technical and functional standards with incidences on different economic, social and environmental levels determines the contribution to sustainable development at a building level. Consequently, the comparison of indicators based on EPDs information of different construction materials does not make any sense if we want to determine which one of the products is the most sustainable. The assessment should therefore be done at the building level for each life cycle scenario.

The industry should support the construction sector in terms of sustainable construction. This is a perfect leverage to ensure the competitiveness of all the players involved and also a need to keep the quality of living conditions for everyone in a long-term perspective. The

⁵⁹ International Organization for Standardizations. (2006). *ISO 14025: Environmental labels and declarations – Type III environmental declarations – Principles and procedures.*

transparent communication of environmental performances contributes to sustainable development.

3.5.3. Fiches de Déclarations Environnementales et Sanitaires (FDES)

The study will concentrate on the French market. It is therefore important to introduce the French EPDs called *Fiches de Déclarations Environnementales et Sanitaires*.

At the beginning of the initiative, having a FDES for a company was a voluntary environmental approach that was used as a communication tool. It has now become a commitment for construction actors in the framework of the “Grenelle de l’environnement” on sustainable building⁶⁰.

More recently, thanks to the publishing of the European Standard EN 15804, having an EPD also highlights a company’s environmental impact according to a European standard that allows a better visibility.

The FDES gives two types of information:

- Environmental data on the product life cycle (based on the life-cycle assessment of all inputs and outputs from the production to the end-of-life). That information is translated into environmental indicators calculated for the whole life cycle.
- Sanitary features of the product

The FDES is a communication tool that provides the results of the inventory in a common format for all construction products. In this particular format, we can find the features of the products, the environmental indicators based on the life-cycle assessment defining its environmental profile, the information “healthy comfort” and information about the issuers of the FDES.

⁶⁰ EV-Dec. (2010). *FDEs ou EPD : Fiches de Déclarations Environnementales et Sanitaires*. Retrieved 1st May 2014, from: http://www.ev-dec.com/fdes_fiches_declarations_environnementales_sanitaires

4. Conclusion

At the end of this theoretical part, we can observe that several important concepts were explained. We have put forward such themes as sustainable development, CSR policies, green marketing and environmental labelling to finish with the application of those concepts to the construction sector that is the sector chosen for the purpose of this study.

In this way, we have seen what is the evolution or application of sustainability principles in today's society as well as how it is perceived in the construction sector.

Based on this theoretical part, we can go to the next step of the research, the qualitative survey. An interview guide was elaborated and was designed for architects in order to have their feelings and perceptions about those concepts in the construction sector.

Chapter 2: Qualitative survey

The survey will enable the researcher to gain knowledge about the theme of the study as well as to gather useful insights for the next steps of the research. In the theoretical part, we have presented and defined different concepts. The survey will allow us to see how these concepts are perceived in reality by the target.

1. Purpose of the survey

The main objective was to have a first approach of the different concepts and to assess the perception of the target regarding different topics such as sustainable construction, certifications and *Fiches de Déclarations Environnementales et Sanitaires* (French EPDs).

In order to have useful insights that will enable us to complete the information gathered in the theoretical framework, a survey was conducted with experts and more specifically with architects. Thanks to the information collected, we can have a first assessment of their knowledge.

2. Methodology

To conduct the qualitative survey, the method chosen consisted in semi-structured interviews that announced beforehand the theme of the interview. In addition, an interview guide was prepared.

We used an interview guide containing the themes we wanted to explore. This type of guide therefore gives an orientation to the discussion. The order of the themes is done in such a manner that it structures the debate through the different topics. The guide may evolve after the first interviews. Indeed, the searcher integrates different aspects and the guide becomes more precise, allowing new ideas to be brought up. After some interviews (3), the guide is definitely refined.

3. The target: Architects

The targets are architects. The primary function of an architect is to plan, design and oversee the construction of buildings. He also has the responsibility of writing the scope

statement for the project and therefore to advise the choice of products. In the construction sector, the architects play a key role in the decision-making process regarding a product or a material. The architect is an intermediary between the client, the provider of materials and the construction material producer.

- The client can recommend or ask for some specifications about the buildings such as choosing a specific product, getting a certification or even the desired design.
- The provider of materials will propose the products available or similar products.
- The construction material producers propose their products on the market.

As he/she plays a key role in the whole decision process, the architect is therefore the perfect target.

3.1. The location: France

BASF has selected six priority countries in terms of construction sector. The reason is that they represent 75% of the market. Those countries are Germany, Poland, France, Italy, UK and Spain. In this survey, the researcher focused on the French market because of language facility. There was no language barrier. It was easier to interact, gather information, investigate and conduct the debate in a language that is perfectly mastered.

Another important point is that, in France, they also have a kind of “French Environmental Product Declarations” called “*Fiches de Déclarations Environnementales et Sanitaires* (FDES)”. It is quite recent because the first FDES was delivered in 2006 and an increasing number of industrials attach importance to such certification. This survey will help assess the target’s knowledge of FDES.

3.2. Target selection process

In order to select the target, the website of the association of French architects was used⁶¹. A search engine is available and facilitates the search of architects in France. It is possible to

⁶¹ Ordre des Architectes. (2014). Annuaire des architectes. Retrieved 30th April 2014, from: <http://www.architectes.org/annuaire-des-architectes/l-annuaire-des-architectes/>

select some criteria, such as the region or status (society, independent, employed or public agent) to manage an advanced research.

The objective was to conduct interviews among the different regions. This offers the advantage of gathering different opinions in a representative sample of the French market.

The architects selected were those who are in a society and have a website. The society is an important element, it means that the architect does not work alone and the projects are larger. Among that short list per region, the selection was done by choosing those who have a website available. It is important because we can see in what kind of projects they are involved. Only those with projects in individual housing, housing and tertiary sector (i.e. administrative buildings or offices) were selected. The reason is that the number of products needed is higher.

4. Characteristics and proceeding of the survey

The survey was conducted thanks to a semi-structured phone interview of approximately 10 to 15 minutes. During this phase, 19 architects were interviewed on three different topics. The phone interview is the best method for gathering information quickly because of the geographical dispersion of respondents. It is a time saving.

Before the beginning of the interview, the theme, i.e. sustainable construction, was announced. In addition, the respondent was informed that the interview would be recorded in order to make the analysis easier.

The interviews guide was structured around three different themes:

- **Sustainable construction**

The objective was to assess their knowledge and understanding of the concept, to see which characteristics are attributed to it and whether sustainability drives their decision-making process. This should enable the researcher to identify their definition of sustainable construction as well as the terms used to define it.

- **Building certifications**

Meeting the requirements of certifications is part of the function of an architect. The purpose was to assess which certifications come to mind first and their opinions about them. It was expected that architects were expected to talk about the FDES (French Environmental Product Declaration).

- **The level of knowledge of *Fiches de Déclarations Environnementales et Sanitaires* (FDES)**

The aim of this topic was to ask them if they know what a FDES is and then ask what they think about it. If they had never heard about FDES, a small explanation of this certification was given to get their opinions.

To finish the interview, additional suggestions or comments were welcome. It was important to give to the interviewee the opportunity to go back to a previous topic or to add any extra information.

It should be noted that the interview guide was composed by open questions and some additional information were asked by the interviewer to have detailed answers to the different concepts.

After the interview, a transcription of the discussion was done. It enables the searcher to understand the nuances and the complexity of the words used. The words of the interviewees were transcribed in an understandable manner without altering or changing what was said.

5. Results of the Pre-Survey

5.1. Sustainable Construction

5.1.1. The concept of sustainable construction

The first theme evoked during the interviews was sustainability applied to the construction sector. Before going into more details and in order to have respondent's definition of the concept, a simple explanation of sustainable construction was asked.

As far as that question is concerned, the first element that came to architects mind was durability. Eleven out of 19 respondents indicated that sustainable construction is the ability to last in time. For them, sustainability refers to coherences of practices in both time and efficiency. It is the buildings performance and making choices today that can help the building to last over time.

Apart from those explanations, 5 of the 19 respondents directly linked the concept with ecology. In their point of view, it means taking into account the ecological criteria. As far as ecology is concerned, the natural and social aspects were underlined.

However, it is important to note that one respondent was very critical regarding this concept. He highlighted the fact that sustainable construction is a trend. Over time, industrials have been polluting and today they are looking for redemption by putting this concept forward.

The other interviewees did not know exactly what it was and were quite vague in their interpretation of the concept.

5.1.2. Indicators of durability: What makes a construction sustainable?

Next, architects were asked to specify the indicators they attribute to durability and more specifically what, according to them, makes a construction sustainable.

Six out of the 19 respondents think that we have to consider this situation from a global perspective. In other words, the optimization of the pillars should be considered. We have to make the best choices possible according to the place, the environmental, the social and the economical contexts as well as to be careful about the impacts. This approach addresses both the energy savings and the respect for the environment that include the choice of materials, thier evaluation in a cycle and the consideration for the social aspect.

Regarding the economic aspects of sustainability, the majority of respondents (13 out of 19) affirmed that sustainable buildings provide a reduction in the energy costs while having an important cost. The cost is certainly higher but the use of sustainable methods or

technologies increases the construction price. However, one respondent wondered to whom this money saving was beneficial (Companies? Users? Architects?).

For some of the respondents (6 out of 19), the social aspect is really important. The project should be in favour of the local development. This fits into the logic of promoting the local dimension by letting local companies benefit from a project. It ensures the sustainability of the local community.

It is obvious for the respondents (8 out of 19) that the environmental aspect should be of utmost importance because the building will be less demanding in energy and the impact on the planet will be minimized. Some of them (4 out of 19) went even further and expressed their desire to be sustainable and to protect the environment. In addition, the life cycle of the product material should be taken into account at the building level.

5.1.3. The influence of sustainability in the choice of a product

When a choice between several products is possible, it is important to know if the sustainability of the product is an argument or not. In order to obtain more information and check out the decision-making process, the respondents were asked what they thought of the importance of sustainability.

All the respondents (19 out of 19) thought that sustainability was indeed important but every architect had his/her own point of view on the question.

When an architect had to choose a product, he/she (11 out of 19) affirmed that he/she was driven by his/her clear conscience because it is better to say that economic or environmental efforts have been made. In the past, those factors were neglected. This responsible attitude cannot be ignored nowadays. They confessed that it becomes natural now. When a comparison has to be done, choosing the material that is the most efficient, the cheapest and the most sustainable in relation to the budget will drive the choice. The budget for them is really important. The first criterion is the global cost of the project. If they still have money to go for a sustainable product, they will definitely choose it but they do not always have the choice.

One architect went further and pointed out that they are used to work with the same products and brands. Their choices are driven by their habits when they have to decide to go for that specific product or brand. They already used it, it worked well for them and they will therefore not look for any other alternatives. According to him, this way of working is certainly a mistake. They are aware of the strengths and/or the weaknesses of a product because they used it in former projects and they know its evolution. They will therefore be driven by their habits to choose a product.

5.1.4. How can they say that a product is sustainable?

Some of them (10 out of 19) were asked how they assess if a product is sustainable or not. Their answers are important to understand on which argument their sustainable choices are made.

Six architects (out of 10) recognized their lack of knowledge when they have to assess the sustainability or the life cycle of a product. Therefore, they hire external agencies specialized in design and technical performance assessments. Those organizations will help them make the best choices in terms of products and will calculate the building performance. Those agencies will tell them what to do and what to change. The architect knows the basic standards but an external organization has a thorough knowledge on that matter.

Also, when they have to determine if a project or a product is sustainable, they usually do this in an arbitrary manner. They choose it because they think that the environmental performance is good. They do not have any specific criteria. Some architects (3 out of 10) admitted that the presence of a label or a certification could influence their choice of products. They will not go further and try to understand what this label or certification is about.

An architect mentioned the importance of assessing the sustainability of a product at the building level. The assessment should be global and therefore more complex. The whole life cycle of the building (the region of production, the transport, its uses and its end of life i.e. recycling) should be a priority. Some methods are today available but they are not complete. They have to be further developed.

5.2. Building certifications

5.2.1. Opinions about environmental certification

First of all, it is important to highlight the fact that architects (15 out of 19) who know some certifications mention always the same ones (RT2012, BBC-Effnergie, Eco labels, FDES or European labels). Those certifications are considered as European, national or regional requirements. Those who do not know any certification (4 out of 19) showed interest to look for further information.

Most of the respondents (11 out of 19) have a limited opinion about certifications. They are aware of the existence of certifications. They consider them as extra information regarding a product but they are not spontaneously asking for it. They will first respect the clients or regional/national requirements and then, if they still have the budget, they will go for sustainable products but not always.

However, some architects (6 out of 19) stated that those certifications are restrictive because they fall within the scope of a technical or normalized opinion. They certify only for example the thermal performance of the building and do not focus on the whole structure.

For some architects (5 out of 19), the amount of certifications available on the market is too considerable. In their opinion, there are too many certifications. They would like to have a limited number of certifications that are more representative. Moreover, they are quite sceptic about their real effectiveness. Those certifications are a guarantee of results so they are important but still unclear. Some architects are asking for the real added value of those certifications.

According to two architects, there is a future for sustainability in the construction sector. However, some countries are more advanced than others. A European harmonization will be therefore useful for purpose of clarification. The European notion seems to be important and the countries should give importance to European decisions at a national level. To move the situation forward, a European clarification and sole guidelines should be implemented.

5.2.2. Do Certifications only benefit to industrials?

During the discussion regarding certifications, few architects (5 out of 19) directly made the link between certifications and industrials. That is the reason why the searcher decided to make a topic about industrials.

According to some architects (5 out of 19), industrials, especially material producers, clearly understand that energy has a cost. That is why they acquired the necessary resources to have certifications. They are at a very sharp end. Industrials therefore are pushing for the implementation of that kind of certifications. They have got the financial resources to have certifications that enable them to differentiate from others on the market.

One architect went further by affirming that industrials invest in resources to gather data about the product. Technical simulations are currently under way to ease the products comparison. In a near future, all simulations will be possible thanks to digital modelling. Even the architect will be able to do that himself. When the architect will open his/her library, he/she will have access to electronic data regarding products. Since producers have accumulated thermal, environmental or technical data, those producers will appear first. They are the ones who will therefore be prescribed. So, what will happen to the local producer who does not have the necessary financial resources?

In addition, one architect has a pessimistic point of view. He stated that certifications do not bring real effectiveness. They are only administrative lobbying. Certifications are a political action conducted by industrials because they polluted during decades. He described the sustainable ideology as a marketing argument with a notion of profit and not a real protection for the environment. According to him, certifications just meet the need to a need of the society to be environmentally friendly.

Also, an architect confirmed that they are not against industrial products because few of them include the environmental impact in their building conception. If an architect assesses that the construction product is more sustainable, he/she will choose it.

5.3. Level of knowledge about the « Fiches de Déclarations Environnementales et Sanitaires »

Architects opinion about this topic is definitely important. During the discussions about certifications, the questions were asked in a way that enabled FDES certifications to be broached. The idea was not to push the FDES first but to try to let the architect introduce it.

When the topic of certification happened to come up during the interviews, only 4 out of 19 architects mentioned FDES in the talks. In their opinion, it is something new on the market that brings more credibility to the product. They were aware of their existence but they did not really know how they are built and what they consist in.

Architects clearly affirmed that it allows the market to have a point of reference but FDES are still imperfect. They think that FDES are based on only few indicators and their creators can manipulate the results. Those results can be interpreted in different ways and the operator may influence those results in his favour. It is thus biased.

Even if architects (3 out of 4) agree on the imperfection of the FDES on the French market, FDES help to develop the market by stimulating the progress. FDES stimulate the reflection. They allow architects to ask themselves questions and develop an objective reasoning regarding the environmental impacts. When they are aware of those multiple environmental impacts, it enables them to avoid making the wrong choices.

One architect added that the building assessment should be scientific-based and should be addressed on building's whole life cycle. They bring transparency and environmental consciousness. To that extent, the scientific method is an added value.

6. Conclusion

First, we should note that when it comes to sustainable construction, the durability is put forward. However, the explanations are nuanced. The environmental aspect seems to be highlighted but the constraint is economic. There is also a trend that links the social pillar with the development of local producers and businesses.

In addition, choices regarding products are not driven by the experience of architects but mostly by the budget available for the whole project. The economical aspect is more important than the environmental one and it has therefore an impact on the sustainable aspect of the project.

Several architects affirm that it exists an important number of certifications available on the market but they do not always understand their meanings. They are not asking for extra information. They confine themselves to the simple presence of a label or not.

Architects also recognized that their knowledge is limited. That is why they do not hesitate to ask external agencies to help them in their process of certifications or buildings/products assessment. Some architects think that the industry is benefiting from the implementation of certifications and that is the reason they are pushing in that sense.

Moreover, they agreed that certifications contribute to move things forward. They allow a better environmental consciousness even if they are at their premises. It is a good way to reassess everything that has been done in the past and to think of the future by integrating the environmental awareness.

Finally, when it comes to *Fiches de Déclarations Environnementales et Sanitaires*, they are not well known among architects. Those who heard about it do not always know the meaning or the basis of calculations.

Chapter 3: Second qualitative survey

This chapter will focus on the second qualitative survey we conducted. It will help us analyse in more details the answers given in the first survey and get concrete information about what are the market perceptions and expectations. The objective of this survey is to have answers that allow the researcher to define strategies in terms of communication related to construction products sustainability.

1. Purpose of the survey

After the completion of the first qualitative survey, the analysis of the results gave us different opinions and perceptions on the themes mentioned. Nevertheless, we wanted to have more accurate and deeper point of views on some issues and as we only had a first impression on the different themes, some answers or opinions needed to be deeper explored. That is why we decided to investigate further the subject and the different themes.

Besides, the research was conducted in collaboration with BASF. Since the aim of this research was to elaborate strategies and find the best way to communicate on the sustainability of construction products thanks to a scientific-based approach, BASF wanted a deeper exploration of the different themes.

Finally, the method of open questions allowed interviewees to have a complete freedom when they answered. The role of the interviewer was to bounce answers off respondents in order to fully understand what their opinion was and to investigate further the question. The researcher was not familiar with the subject at the beginning of this work. He learned the different particularities of this subject and how architects perceived them during interviews. The interview was well done for some themes but after the proofreading of the transcript other questions still appeared. For that reason, another qualitative survey was conducted.

2. Methodology

To conduct this qualitative survey, the methodology was exactly the same as in the first one. The method consisted in semi-structured interviews with the announcement of the theme beforehand. The targets were architects selected in the same manner.

The only element that was different from the former survey was the elaboration and the composition of the interview guide. The latter was based on the trends brought out from the first survey.

3. Characteristics and proceeding of the survey

The survey was conducted in the form of semi-structured interviews of approximately 20 to 35 minutes. During this phase, 36 architects were interviewed on five different topics. As for the first survey, the theme was announced beforehand and the respondent was informed about the recording of the interview to ease the transcript.

4. Interview guide

This interview guide has the particularity of being more complex and of containing precise questions on different themes. In that interview guide and for all the different themes, open questions and closed questions were mixed. All the questions were based on the answers and trends pulled out from the first survey. Each interesting word or expression found was put in evidence in the different questions. In that sense, closed questions were provided to the interviewees who had to choose between a set of answers and to assess them in a rating scale.

The advantage of closed questions is that they ease the understanding of the question, the expression of the answer and the compilation of results. Closed questions are difficult to create but easier to analyse. Their main disadvantages are that they limit the speech or that they influence the respondents. In order to counter that, all the expressions and words found in closed questions were based on the arguments and words pulled out from the first survey. In addition, we have worked with experts on the subject that could answer better such questions. We wanted to check the perceptions of architects about the different themes. In addition, immediately after the rating, respondents were asked to express any additional comments regarding those closed questions. It was not an obligation but, based on the answer, the interviewer tried to ask sub questions related to the rating in order to fully perceive why that choice was made.

4.1. Themes of the interview guide

The interview guide was structured around five different themes:

- **Sustainable construction**

This theme enabled the researcher to identify the definition of sustainable construction given by architects. As it was the case in the first survey, the interview guide starts with sustainable construction. This question is a key one because it enables the researcher to have the architects' understanding of the concept without asking specific questions or influencing their answer through closed questions.

- **Construction products choices**

It is obvious that for the purpose of the research we have to know what characteristics are assigned to sustainable construction products and on which elements architects' decision-making processes are based. The most important element is to understand if architects are driven by sustainability in their decision-making process as well as defining the criteria taken into account. Expectations are now higher, the researcher went into more details and sub questions were more specific and based on architects' interpretation of the concept. Thanks to closed questions and the opinions gathered in the first survey, we can have additional and more accurate information and put all the elements in perspective.

- **Communication about the environmental performance of construction products**

In the former survey, this topic was not broached but it appeared during interviews that it is important for the purpose of the research. From what we have observed, the topic covered was the communication of construction producers about the environmental performance. It was expected to know what architects think of this communication, how the information is conveyed, the content and the effectiveness of the message, what is the best way to pass on the message and if they are interested in that kind of information. This should help the researcher in identifying the architects' level of acceptance and the mean preferably used for expressing that type of information.

- **Environmental certifications**

Certifications confirm the quality of a product. They nourish the confidence in a product and facilitate decision making by asserting the quality of this product. By approaching this topic, it would help us define if it is also the case for environmental certifications. We asked architects what was their definition of the concept, the importance of certified products and what kind of approach (the whole life-cycle or single criteria) they prefer regarding environmental certification.

- **Fiches de Déclarations Environnementales et Sanitaires (FDES)**

We have learned from the conclusions of the first survey that FDES are not generally well known. Only few architects are aware of their existence. This interview guide gave the researcher the opportunity to go deeper into that concept. Architects who knew FDES were asked additional questions regarding their perception and the effectiveness of FDES as well as if their choices are driven by them or not. On the contrary, for those who did not know the definition of FDES, the concept was explained and their opinion regarding that type of certification was asked.

5. Results of the survey

5.1. Sustainable Construction

5.1.1. The concept of sustainable construction

To start the interview, the same question as in the first survey was asked about architects' interpretation of the concept of sustainable construction.

As in the first survey, the durability was also one of the first elements that came to architects' mind. For 19 out of 36 respondents, the same arguments such as the ability to last in time or the coherence of practices in both time and efficiency have been put forward.

However, for some of the respondents (10 out of 36), sustainable construction is a responsible construction regarding the next generations. It implies the intention of meeting the needs of today while at the same time preserving those of tomorrow. Each actor involved in the construction sector should apply the principles of sustainable development in order to limit the consequences of buildings activities on the environment or on the society.

Among those ten respondents, other arguments were expressed to complete the definition of the concept. Two architects expressed the importance to have a long-term and global vision of the construction impacts and not limit them to the energy performance often put forward. A global approach takes into account the optimization of the three dimensions of sustainable development that are the environmental, the social and the economical dimensions. Another architect defined the concept as an environmentally friendly construction that is respectful of the humans. He also added that the materials used should have to be reusable and bio-based.

In addition, three out of 36 architects integrated the two notions that are the durability and anticipating the needs of next generations by making responsible choices today. Indeed, the construction projects need to be developed in a careful way by integrating a global approach as well as an ability to last over time. For those three architects, the impact should be positive for the environment while acting in the long-term on the society. Sustainable constructions have to be able to permanently adapt to change.

Then, two out of 36 architects directly linked the concept with industrials while two others linked it with ecology with the same interpretation of the first survey (see chapter 2).

5.2. Construction products choices

5.2.1. *Criteria*

This section is divided into two different parts. The first one will present the results of the open question and the second one, those of the closed question for the same topic.

5.2.1.1. Part one: open question

This first question was open. The respondent had to explain which were, according to him, the main criteria regarding construction product choices.

When the interview came to construction product choices, numerous criteria came up but the most frequently mentioned is the **best value for money** (21 out of 36). Architects have a budget for the entire project and it is important for them to stick to it. In that way, they are looking for the best quality at the best price. Also, if they can find less costly alternatives

with equal performances, they will not hesitate and choose the alternative. The price is one of the main decision criteria.

Moreover, if the best quality at the best price-quality ratio is certainly important, the quality itself is also important. Architects (13 out of 36) do not choose the best price-quality ratio for all products. Some products need to be the best in terms of features whatever the price. The initial cost, considered to be expensive, can be seen as an investment. Indeed, the decision to go for a product with an improved quality will imply a consequent cost reduction during the life of the product. For example, if you have to choose between two different types of insulation products with different quality and price, the one that is the most costly will allow a better insulation and therefore the invoice price of energy consumption will be reduced. An architect needs to evaluate the different alternatives in terms of quality and consumption.

For 14 out of 36 architects, durability is something that they have in mind during their decision-making process. It seems obvious for them to know what the lifespan of a product is. If they have to replace it in few years, there is no interest in choosing that specific product. The more a material will last in time, while offering the same performance, the more often they will go for it.

Several architects (11 out of 36) mentioned that the nature and the origin of products are key criteria. The origin of the products is important because they want to know if their choices enable the economic development of a region or a producer. If they can contribute to the local community, they will not hesitate. The nature of the product is for example its components or the type of material involved. For certain purposes, they will prefer a natural product such as wood for example.

Only 5 out of 36 architects also want to be aware of the materials' life cycle. The notion of life cycle implies the different phases of life of the product, from the production phase to the end of life and therefore the recycling of the product.

5.2.1.2. Part two: closed question

In this second part, the closed question was based on the arguments brought forward in the first survey. The respondent had to rank from 1 (not important at all) to 5 (very important) the criteria that could drive their choices.

	1 Not important at all	2 Not very important	3 Neither important nor unimportant	4 Important	5 Very important
I have always done it in this way	12	18	4	2	0
I am satisfied because I already used that construction product	6	16	12	2	0
I have a good knowledge of the construction product performance	1	10	12	12	1
The cost of the construction product	0	0	24	11	1
The recommendations of the producer	5	9	9	13	0
The environmental performance of the construction product	0	4	14	4	14
The durability of the construction product	0	6	0	17	13

Figure 2: Summary of the results (Q3)

- **I have always done it in this way**

The results show that architects are not driven by their habits when they have to decide which construction product they are going to choose. Thirty respondents (out of 36) think that it is not important. According to them, each project is different because the requirements and the expectations vary from one project to another. In that sense, the approach in terms of products choices will be based on what was stated in the initial project specifications that

need to be followed. If they are driven by their habits, they will not respect the requirements and expectations initially established.

- **I am satisfied because I already used that construction product**

The satisfaction coming from the fact that the product has already been used in former projects is not an important criterion for 22 respondents (out of 36) and neither important nor unimportant for 12 respondents. Architects will always look for and compare the different alternatives. Their choices are conscious. Since each project is different, their satisfaction for one specific product in former projects does not mean that the evolution of the product will be the same.

- **I have a good knowledge of the construction product performance**

The knowledge of the product performance is important for 13 architects (out of 36), neither important nor unimportant for 12 others architects and not important for the 11 architects. They affirmed that they have a limited knowledge of the strengths and weaknesses of several products. However, they will not choose a product because they already know it. They always evaluate the different alternatives.

- **The cost of the construction product**

The cost is neither important nor unimportant for 24 architects (out of 36) and important for 11 architects. They affirmed that the global budget of the project is more important than the cost of the product. If they have a consequent budget, they will choose the best products and pay less attention to the price. However, this never happens. They always have budget restrictions. That is why they will assess the best value for money. At equal quality and performance, they will choose the less expensive product. In addition, if they can allow future savings, architects will go for a product slightly more expensive but more efficient in terms of performance. It depends therefore on the project and the initial budget and not on the cost of the product.

- **The recommendations of the producer**

Regarding the role of the producer as an influence in the decision-making process for a product, the opinions are quite different. If some architects (13 out of 36) agreed on the fact that the recommendations of the producers are important criteria, others (14 out of 36) declared that their opinions are not important. In addition, for 9 architects, it is neither important nor unimportant. Several architects have confidence in the viewpoint of their producers. Architects will be somehow influenced because the distributor knows well the product he/she is selling. Architects also insisted on the fact that the role of producers was important when they could not choose between two products or when a product chosen is not available in the inventory.

- **The environmental performance of the construction product**

The environmental performance of the product is important for 18 architects (out of 36). Indeed, it is a criterion that they increasingly take into account. However, they have different techniques to assess the environmental performance of the construction product (See 5.3.).

- **The durability of the construction product**

The durability of the construction product appears to be a key element that will drive architects' choice for a product. Indeed, 30 architects (out of 36) are unanimous: it is an important criterion. It is important to note that the durability has a different meaning from one architect to another (See 5.2.3.).

5.2.2. The importance of construction products durability

For 30 out of 36 architects, the durability is definitely an important factor for construction products. They are unanimous on that point of view but the reason why it is important for them is different from one architect to another.

For 23 architects out of 36, the importance of durability is a key element because it allows them to be aware of the environmental issues of a product. In that sense, a product considered as sustainable ensures limited impacts on the environment.

Several architects (7 out of 36) confirmed that they can preserve the environment by choosing environmentally friendly products but they have to be sustainable and must be assessed on their entire life cycle. This might allow the next generations to demolish the building or to renovate it for a second use.

Moreover, 4 architects out of 36 thought that a material that deteriorates in only few years has sometimes an interest for businesses. We are living in a consumption society. When we get rid of things we buy new ones. The product has to last in time but not too long because businesses want to increase their profitability. They will push for a limitation of the lifespan to replace it. This is what we can call planned obsolescence.

Two architects out of 36 stated that the importance of product durability depends on the use and the function of the building. For them, there is functional and aesthetical durability. They said that if we take ruins as an example, the importance of durability is even more important than the aspect.

5.2.3. How the durability of a product is determined?

5.2.3.1. Part one: open question

As durability is a factor that is taken into account in the selection process, we wanted to know how it was determined.

First of all, 30 architects out of 36 who consider durability as important define it as the ability to last in time as observed before (see chapter 2). This is the first thing that comes to their mind when they have to determine durability.

Secondly, another argument stated by architects (13 out of 30) is the ability to satisfy functional and technical requirements while optimizing the environmental, social and economic performance in the entire life cycle of the construction product. All the impacts on the environment or on the energy consumption are reduced to the minimum. One architect also mentioned the chemical and carbon footprint of a product.

For 7 architects out of 30, a sustainable product is a product that promotes the development of the local economy. Those architects will prefer an equivalent product that is

geographically closer to them because it allows savings on transportation, local investments and some community benefits.

For 4 architects out of 30, product certifications are a guarantee of the product's durability. Those certifications will influence and drive their choices. They will limit themselves to the simple presence of a certification and will not ask for its meaning or assessment.

Two architects out of 30 mentioned that they pay attention to what is indicated in the brochure delivered by the manufacturer of the product or to the information available in specialized magazines.

Finally, two architects out of the 30 think that a product is considered as durable if the product is said « ecological ».

5.2.3.2. Part one: open question

In order to determine what makes a product sustainable, we have also some items to architects. We can see that for each one, more than three-quarters of the respondents (more than 27 out of 36) agree with the different propositions.

Indeed, 30 respondents (out of 36) defined it like products that last in time and all the respondents (36 out of 36) also stated that they are products that minimize the environmental impacts over their entire life cycle.

In addition, for 23 architects (out of 36), a product considered as sustainable is a product that takes into account the economic dimension of the life cycle as well as for 29 architects (out of 36) promotes the local producer.

Then, all the respondents agreed with the definition of sustainable products we proposed them. According to them, it is a product that meets the functional and technical requirements while optimizing environmental, social and economic dimensions on the life cycle.

Sustainable products are products that :	Strongly disagree	Disagree	Neither	Agree	Strongly agree
Last in the time	6	0	0	12	18
Minimize the environmental impacts over their entire life cycle	0	0	0	6	30
Take into account the economic dimension of the life-cycle, namely the investment and the cost during the use	0	8	5	10	13
Support the local producer	0	1	6	14	15
Meet the functional and technical requirements while optimizing environmental, social and economic dimensions of the life-cycle	0	0	0	16	20

Figure 3: Summary of the results Q6

5.2.4. How can architects determine that a product minimizes the environmental impacts?

This topic aims at understanding if a product minimizes environmental impacts or not. We have based the different propositions on the opinions gathered from the first survey. We can see in the following figure that the majority of respondents agree to each affirmation.

First of all, a label or an environmental certification puts an emphasis on the fact that the product was successfully tested and provides additional information about the environmental impact. 24 architects (out of 36) agree that a label or an environmental certification helps them confirm this premise.

For more than one-half of the survey respondents, the presence of recycled and renewable materials determines that the product is environmentally friendly for respectively 30 and 25 of them (out of 36).

Thirty-three architects (out of 36) agree on the fact that the life cycle performance permits to assess the environmental impacts of a product and 34 architects stated that the contribution to the life-cycle assessment of the building is also important.

In addition, 24 architects (out of 36) need the help of external specialized agencies in order to make the assessment of the environmental impact. Nine architects sat on the fence.

Finally, based on the information gathered in a specialized guide, the respondents can have access to a ranking of the different products performance regarding their environmental impacts. Twenty-one architects agree that this information helps them in their evaluation of the product.

	Strongly disagree	Disagree	Neither	Agree	Strongly agree
The presence of a label or an environmental certification	0	4	8	18	6
The presence of recycled materials	0	0	6	20	10
The presence of renewable materials	0	0	5	25	6
The life-cycle performance	0	0	3	24	9
The contribution to the Life-Cycle Assessment (LCA) of the building	0	0	2	18	16
The help of specialized agencies to make the assessment	0	3	9	15	9
The use of a guide that classifies materials based on their environmental performance	4	3	8	16	5

Figure 4: Summary of the results Q7

5.3. Communication about the environmental performance of construction products

5.3.1. The environmental performance information given by manufacturers

Manufacturers increasingly communicate about their performance to highlight their initiatives towards the environment. In this section we will see how architects perceive this information.

Twenty-one out of the 36 respondents affirmed that manufacturers communicate enough on the products' environmental impacts but 15 out of the 36 respondents think otherwise. Architects are used to have additional communication from manufacturers on products but the number of information shares the view.

Half of the respondents (18 out of 36) say that the content of the message provided by manufacturers is neither efficient nor inefficient. According to them, the information given is incomplete and not sufficient to determine the environmental quality of the product. Several architects (5 out of 36) think that most of the time the information is not efficient. Manufacturers always try to promote themselves and orientate the message in their favour. However, a small proportion (13 out of 36) affirms that the message is efficient but it does not allow them to clearly know if it is enough or not.

Moreover, 21 respondents out of the 36 think that manufacturers contribute to make progress. They can help to change people's mind and increase awareness regarding the environmental performance. Nevertheless, for several architects (8 out of 38), it is not the role of manufacturers to communicate because the message is biased in their favour. They affirm that this is more the role of a regulatory authority or a specialized press on condition that there is no conflict of interest. Seven respondents (out of 36) neither agree nor disagree.

5.3.2. The importance of communicating on the environmental performance of a product

It is important for 28 respondents (out of 36) and not important for the other 12 respondents to communicate on the environmental performance of a product.

The respondents in favour of that communication think it is important because it allows them to highlight environmental concerns as well as being more efficient regarding those preoccupations. They also add that thanks to this communication, they have access to extra information

For the respondents (10 out of 36) that do not attach importance to the environmental performance information, it is quite clear: this is greenwashing. The credibility and the reliability of the information need to be questioned. It is purely a deceptive advertising that attempts to claim that the product is environmentally friendly without actually following that practices.

5.3.3. The best means of communication for environmental performance information

When architects have to define the best means of communication for environmental performance information, it was difficult and the answers came late. They hesitate and take some time to answer.

Moreover, architects mentioned numerous means in the open question and all the means proposed in the closed question were expressed. That is why it will be easier to base the results on information gathered from the closed question.

The first mean of communication exposed to the respondents was the brochures. For many architects (24 out of 36), this information is relevant because it helps them to have an overview of the environmental performance of a product. However, they know that manufacturers make those brochures and therefore they try to be critical regarding the information provided. According to them, this is the first mean of information. The brochure often accompanies the product. However, 8 respondents (out of 36) strongly disagree and 4 disagree. For them, there is, as previously said, a conflict of interest because the brochures are produced and distributed by the manufacturer himself.

Specialized magazines are the most seen and trusted means by architects. Indeed, 12 and 22 architects (out of 36) respectively agree and strongly agree on the fact that a specialized magazine is the most accurate source of information regarding products. The reason is that those magazines are provided by another source than the manufacturer. They are more influenced by the information described in those specialized brochures.

Certifications are for 21 architects out of 36 a good mean to communicate on the environmental performance. Architects are sensitive to the presence of certifications because it gives more credible information. However, according to them, the number is quite

important and they are essentially pushed by industrials (see 5.4.). It is therefore important to know which organizations certified the products. Nine respondents (out of 36) neither agree nor disagree

There is no general trend emerging from the communication during trade fairs. Opinions are divided. The reason is that not all architects go to those fairs. For architects who go to trade fairs (9 out of 36), the information about the environmental performance of a product is interesting and has the particularity of being discussed directly with the manufacturer.

The recommendations given by the distributor are a good source of information for 5 (out of 36) architects that strongly agree and 13 others that agree. They trust the knowledge of their producers because they are used to work with them. A producer knows the weaknesses and the strengths of the product he is selling. Eight out of 36 architects sat on the fence and 10 disagree.

5.4. Environmental certifications

In this section, we wanted to have the opinion of architects regarding environmental certifications.

5.4.1. Meaning of environmental certifications

The respondents were quite hesitant in defining environmental certifications. They took some time to answer. It is a concept that is not clear in their minds. They know what environmental certifications are and they provide examples but when they have to define it, it was more difficult.

First of all, about the majority (17 out of 36) of respondents spontaneously defined those certifications by providing an example such as HQE, NF Logement, BBC-effinergie, or H&E. They do not have a specific definition or explanation of the concept. According to them, those are proofs that a third party controlled the products. This independent organization or actor states that the product respects some requirements in terms of environment, light or heat.

For eight architects out of 36, environmental certifications are requirements at European, national or regional level. They know that they have to meet some standards in order to respect those requirements. If there is for example some regulations at a regional level for a building, they will meet the conditions in order to obtain the certification but only because it is required. They will not try to get certifications if it is not mandatory.

Six architects out of 36 defined those certifications as a set of criteria that need to be followed and elaborated by professionals, scientists or industrials who give the right to obtain a certification. If those criteria are met, the product can thus have a certification. They also add the importance of the control of an independent third party.

The last 5 respondents have a pessimistic opinion about certifications. For them, it is purely lobbying. The behaviour of industrials has been questioned for years. That is why certifications are a tool to say to the society that industrials are aware and pay attention to the environment and to the society. For one of those respondents, an industrial just pays to certify that his actions are not as bad as people might think. This is a “recognized” way to say that they are environmentally friendly.

5.4.2. The importance of environmental certifications for a construction product

The opinions of the respondents regarding the importance of environmental certifications are quite different and are split into three different trends.

First, 18 architects out of 36 said that this is something important that helps them drive their choices for construction products. It is important to have that information about the product because it stipulates that the products were tested and meet the environmental standards. Among those respondents, several affirmed that is important but that certifications are restrictive (see 5.4.3.).

Secondly, some of them (8 out of 36) sat on the fence. For them, labelling is not a way of certifying the quality of the product. It is only a proof that the product was controlled. In their opinions, it also depends on what kind of certification is provided. Some certifications are totally biased because they were made by industrials and have therefore no value.

Finally, for the other respondents (8 out of 36), it is not important for a product to obtain a certification because the latter is biased and pushed through by industrials (see 5.4.1.)

5.4.3. About environmental certifications

First of all, the number of environmental certifications is fairly important for 22 respondents (out of 36) and too important for 8 respondents. However, 6 respondents think that the number is fairly low. For nearly three-quarters of architects, there is an important number of certifications on the market and sometimes it is not easy for them to know all of them.

	Too low	Fairly low	Fairly important	Too important
The number of environmental certifications is:	0	6	22	8

Figure 5: Summary of the results (Q 9.1.)

After that, architects were asked what they thought of restrictions of the environmental certifications. For 19 architects (out of 36), the environmental certifications are somewhat restrictive and 8 architects stated that they are too restrictive. They do not always have the resources or capacity to meet those criteria. They ask for more flexibility. However, for 9 architects, it is the opposite, they ask for more restrictions because it is a way to find alternatives and develop other methods.

	Not restrictive	Not enough restrictive	Somewhat restrictive	Too restrictive
Environmental certifications are:	0	9	19	8

Figure 6: Summary of the results (Q 9.2.)

In addition, three items were proposed to the respondents and they had to say their level of agreement about each.

All the respondents (36 out of 36) agreed with the proposition: “I prefer a limited number of certifications but more efficient ones”. For them, if the number of certifications can be reduced in order to have more efficient ones, they will prefer it. Architects think that it exists certifications for everything and sometimes it is quite difficult for them to know and identify all of them.

All the architects (36 out of 36) also think that environmental certifications are essentially pushed through by industrials. In their opinion, industrials are behind certifications because they want to have a “standard” way of showing their environmental respect and implications.

Finally, 32 architects (out of 36) agreed that environmental certifications are marketing tools set up by industrials.

	Strongly disagree	Disagree	Agree	Strongly agree
I prefer a limited number of certifications but more efficient ones.	0	0	20	16
I think that environmental certifications are essentially pushed through by industrials.	0	0	9	27
I think that environmental certifications are marketing tools set up by industrials.	1	3	18	14

Figure 7: Summary of the results (Q 9.3.)

Finally, respondents were asked which approach they prefer for an environmental certification. The two propositions were:

- An approach that takes into account environmental impacts during the entire life cycle of the product and during its application.

- An approach that only expresses some simple criteria on a product.

Twenty-seven respondents (out of 36) were in favour of the first proposition and the last 9 respondents were in favour of the second one. Indeed, some of them (9 out of 36) said that simple criteria are enough to show the environmental implication of the product. For the others (27 out of 36), it is an obligation to be environmentally friendly during the entire life cycle. Only one phase of the product's life cannot be taken into account. If you want to limit the impacts on the environment, you should do it at each step of the life cycle.

5.5. Fiches de Déclarations Environnementales et Sanitaires (FDES)

This was the last topic mentioned in the questionnaire. Respondents were asked if they know or do not know FDES. If they knew them, additional questions were raised. If they did not know them, we wanted to have their opinion after explaining what it consist in.

5.5.1. Respondents who know FDES

Only 7 architects out of the 36 had already heard about FDES. With those respondents, we went further and asked them additional questions. However, among those 7 architects, only 4 really knew what it was. The others had heard of it once or twice.

Three architects (out of the 7) insisted on the importance of having a FDES for a product. For them, it is important for the presentation of the products to the client. It allows them to have an argument on the environmental impacts of the product when they meet a client. If the purpose of the project is to be environmentally friendly, FDES are good standards to put forward. It provides reliable and transparent information because it is scientific-based.

Those three architects also stated that the presence of FDES would influence their choices regarding products. If a product has a FDES, they will take it into account because it is an important argument. They think that a FDES provides condensed information and that it is an important tool to be credible regarding the impacts on the environment. They also added that it gives additional explanations to the person in charge of the project.

Nevertheless, they all (7 out of 7) said that this information is a minimum and has to be combined with other arguments and criteria (See 5.2.1.). For one architect, the information is

overloaded. There is a lot of technical information that is not always understood. A summary and more simple explanations of the figures would be better for him.

5.5.2. Respondents who do not know FDES

When the concept of FDES was presented to the 29 respondents who did not know them, their first impressions were quite positive.

The majority (21 out of the 29) said that it is interesting and that they will look for further information. They needed to have additional explanations and see what it is exactly.

Three architects out of the 29 asked a few questions about what it was concretely and showed a strong interest. For them, it is a good idea and they will ask for FDES for their future projects.

One architect added that the problem is that they do not have the time to compare the products and to know exactly what the performance of each product is. It certainly takes some time to evaluate all the alternatives. However, an increasing number of online libraries can help them to do this.

Another architect said that is good but naive at the same time. According to him, the environmental value could not be objective. Indeed, few criteria and standards coexist in a building project. He also added that the way you assess the performance depends on your role in the project (builder, client, architect or industrial). The environmental value should be assessed on the entire life cycle and that implies measuring the future evolution of the product and therefore should not be restricted to a document that validates the industrial past of a product.

The three architects left (3 out of 29) sat on the fence and were pessimistic about FDES. They think that it does not bring an added value to the market.

6. Summary of the results

In the following section we present the conclusion of the two qualitative surveys.

When it comes to sustainable construction, the durability is highlighted. Architects define most of the time the durability of a product as the ability to last in time. However, some of them also add the responsibility for the generations and therefore the ability to satisfy functional and technical requirements while optimizing environmental, social and economic performance in the life cycle of a product.

During the decision-making process, the sustainability is important but the best value for money is also important. Architects have a budget for the entire project and they have to stick to it. Sometimes, if they can anticipate future earnings, they will go for quality. Nevertheless, they are not driven by the cost, the satisfaction or by their habits regarding a construction product but more by its durability and its environmental performance.

Architects think that product that minimizes the environmental impacts is a product that has a label or an environmental certification or that is made of recycled and renewable materials. Besides that, the contribution to the Life Cycle Assessment (LCA) of a building, the help of specialized agencies and a products' guide are also important elements of the definition.

In addition, architects think that it is important for manufacturers to communicate on the environmental performance of their products. However, they pointed out the greenwashing practices of a few of them. The best mean to communicate on the performance for architects is through manufacturers' brochures and specialized magazines. In their opinions, industrials are seen as important actors who help to make things happen even if their messages are biased in their favour.

Architects are aware of environmental certifications but their exact meaning is not always completely understood. It is vague for them: environmental certifications are a sign of quality and define an environmentally friendly product. They easily cited a few certifications but did not really explain their purposes.

Moreover, if a product has a certification, the latter can help driving their choices but the number of certifications is too important and they are currently too restrictive. Architects think that a limited number of certifications which would be more efficient will be better.

Nevertheless, it is clear for architects that those certifications are pushed through by industrials and used as marketing tools to promote their environmental friendliness.

The preferred method for environmental certifications is an approach that takes into account environmental impacts during the life cycle of the product and during its application.

We have also observed that FDES are not well known by architects. However, they have shown an interest for further information.

Chapter 4: Conclusion, Managerial Implications, Research limitations and Future Research

Conclusion

The purpose of this research was to study the perception of the French market regarding environmental performance information in the construction sector. This helped us to identify architects beliefs and confidence in this type of information. The research was divided into four different chapters.

The first chapter set the context of the study. We went through the evolution of sustainable development and the emergence of Corporate Social Responsibility practices in companies. After that, we explained the relation between communication and sustainable development by presenting green marketing and environmental labels and certifications. Finally, we put in evidence sustainable development practices applied to the construction sector and we demonstrated its significance.

Next, we conducted two qualitative surveys by using a marketing research method. The first one allowed us to have first insights about the different concepts and the second one helped us to dig deeper in the different themes and opinions gathered from the first survey.

Finally, the achievement of this study is an added value for BASF. It will help them define their strategies regarding the environmental performance communication about their construction products.

Managerial Implications

This research has been possible thanks to our partnership with BASF and therefore managerial applications are important for them. It will provide them some recommendations to define their strategies in terms of sustainability for construction products.

- **Education of the market**

We have observed that the majority of architects define sustainable construction as the ability to last in time. However, sustainable construction is the application of sustainable development along the construction value chain. It is therefore a holistic approach balancing economic growth, environmental protection and social responsibility and taking into account the technical and functional requirements. We can definitely recommend educating first the market about this concept. It will help architects to see the concept as a global optimization of the sustainable development pillars.

Once the market will have acquired those notions, a communication about the products certifications and the practices implemented by the company should have to be highlighted. The architect would be therefore more sensitive and receptive.

- **Education through local or regional associations (clusters)**

As stated in the last point, the market needs to be educated about sustainable development practices. In France, there are few local and regional associations called clusters that aim at educating the market. BASF needs a local or a regional partner to spread the message such as the clusters. A good strategy will be first to contact those associations and share their experiences in order to adopt the same position. If they all are on the same page, associations could be a local or a regional spokesperson. It seems obvious that the intention of the protagonists should not be commercial but educational. Thanks to this, sustainability can become an important criterion in their decision process and architects will probably pay more attention to environmental certifications.

- **Clear and understandable message**

The results of this research put in evidence the fact that architects limit their judgements to the sole presence of certifications. The message should be brief, powerful and understandable by everyone. Architects do not pay attention to exhaustive information. Concise but persuasive information would be recommended.

- **Content of the message**

We have seen that architects pay attention to the best value for money of the product. We would recommend highlighting the environmental performance of the product and at the same time show the future savings in terms of energy and money that the product makes possible. In addition, if extra information is provided, this information should be clear and understandable as previously said.

- **Means of communication**

The most trusted means of communication by architects are specialized magazines and manufacturers' brochures. Investing in that means will be a good way to communicate about the environmental performance of the products.

- **Comparison tools should be developed**

The lack of comparison tools is one of the reasons that explain why that architects do not pay attention to alternative products. This kind of tools should be developed and made available for all the architects. A product can therefore be easily compared thanks to different criteria.

- **Advocating for improved regulations**

Regulations in the construction sector are not only coming from governments but also from the market itself. In order to have improved regulations, the recommendations would be to advocate for the introduction scientific-based evaluations. A higher level of sustainability can be encountered by pushing for multi-criteria requirements. If the improved regulations are based on a scientific and multi-criteria approach, the importance of recognized

certifications will be higher. The architects will pay more attention of the meaning to the certifications because there are some requirements to follow.

- **Fiches de Déclarations Environnementales et Sanitaires (FDES) based on more relevant indicators**

FDES are potentially powerful tools. Their concerns and their efficiency are directly related to a change of current practices in order to move towards a greater respect for the environment. Indeed, they are different from EPD because less relevant indicators are taken into account. There is therefore a need to elaborate FDES with more relevant indicators.

- **Get to know FDES**

The conclusions of the two surveys have shown that FDES are not well known. Only several architects had heard about it. There is a need to educate the market first to environmentally friendly practices and then promoting the importance of having such a tool.

- **Change of industrials image**

On the one hand, industrials are always seen as the polluting actor but on the other hand, we have observed that they contribute to move things forward. They think that time for change of practices has come. It means promoting environmental certifications. Nevertheless, in order to give more credibility to those tools, they should first change people's mind and try to get a positive image. They need to put forwards the human and responsible concerns as well as the environmental practices at a company level without falling into greenwashing.

Environmental responsibility is a priority for each actor involved in the construction sector and even more for industrials. They all want to move things forwards but there is still a long way to go to reach more concerns about environmentally friendly practices. If everyone acts at his/her level he/she will contributes to global changes.

Research Limitations and Future Research

All studies have limitations. In the present topic, we will present the different limitations of this research.

- **Expert**

The subject is technical and therefore there is a need for an expert to conduct the survey. The researcher was not a technical expert in that domain. The research was thus a learning experience and continuous improvements. In order to tackle that lack of knowledge, the researcher asked an expert when it was needed and showed its interest by making some research thanks to books, specialized magazines and articles. Even if the subject was rapidly mastered, the need for a technical expert insight was required to go further in technical answers.

- **Languages**

The study was conducted in French by a French-speaking interviewer. This has the advantage of easing the conversation with the different respondents and enabling a better understanding. However, the thesis was written in English because it was imposed by BASF in order to facilitate the share of results and also to follow the same methodology among the different European countries in which BASF operates. The researcher tried therefore to be as close as possible to the reality, but some variations can occur due to the translation of one language into another.

- **Phone interview method**

Each person surveyed was contacted by phone. This has a few advantages such as time saving or collecting information quickly but it also has some limitations.

First, it is difficult to have a detailed questionnaire for more than 30 minutes because the respondents cannot focus for a very long time. In addition, several respondents might show a tendency to give shortened answers or answers that give the possibility to the interviewer to rekindle the discussion.

Secondly, the phone does not allow the showing of visual stimuli. It would have been a good idea to give the opportunity to give the respondents the opportunity to choose between different certifications based on their design.

Third, it was difficult to plan the different interviews on such a theme because the architects were busy or thought that the interview was in fact a commercial attempt to get information. For more than 600 architects contacted, 10% (55 respondents) agreed to be surveyed. There is no need for a representativeness of the sample because BASF wanted to gather opinions of architects. The surveyed were probably less busy architects who did not work on a specific project.

- **Quantitative survey**

The methodology followed during this research could be adapted to any other country. The two studies were qualitative because, in accordance with BASF, we wanted to go further on the different subjects. However, in order to confirm the results obtained, a quantitative survey would have been interesting. In addition, the use of visual stimuli could have also been relevant but the method of phone interview did not allow us to do that.

- **French market**

The study was focused on the French market but there are EPDs for each European country. In future researches, the study could be undertaken in other countries to compare the different perceptions and opinions regarding the different themes in a global way. In addition, BASF has selected six priority countries that represent 75% of the construction sector. This could be interesting to study the differences between those countries to personalize the strategy for each country or to follow a global strategy.

- **French market**

The targets of the survey were architects but they are only one of the actors involved in the construction sector. Even if they are the central piece in the decision-making process for construction products, a study of the other actors such as the regional clusters or the distributor would be relevant.

To conclude, this study was really important in terms of learning for the researcher as well as for the partner, BASF. This will help to define BASF to define its strategies and to advocate for improved sustainable practices.

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Appendixes

Appendix 1: Interview Guide

Guide d'entretien

Construction durable

1. Que signifie pour vous la construction durable ?
2. Quelles caractéristiques attribuez-vous à la construction durable ?
3. Est-ce que la durabilité est un facteur qui influence votre décision lors du choix d'un produit ? Si oui, pourquoi ?
4. Comment déterminez-vous ce qui est durable (pour tous les produits ou certains produits) ?

Certification (Green Building Rating System)

5. Connaissez-vous des certifications en matière de durabilité (voir si ils se basent sur le produit et le bâtiment et orienter le débat) ? Si oui, lesquelles ?
6. Laquelle de ces certifications valorisez-vous le plus ?
7. Que pensez-vous de ces certifications ?

EPD

8. Connaissez-vous une méthode de certification qui permet d'évaluer un produit à l'échelle du bâtiment sur tout son cycle de vie ?
9. Connaissez-vous les EPD ? Si oui, qu'est-ce que c'est ? (si non, expliquer ce que c'est)
10. Que pensez-vous qu'un produit possède une EPD ?

EPD vs Certification

11. Savez-vous que les EPD peuvent vous faire gagner des points dans les certifications de type : Green Building Rating System type LEED, HQE, BREEAM, DGNB
12. Avez-vous des commentaires ou suggestions ?

Un grand merci,

Appendix 2: Interview Guide (second qualitative survey)

Guide d'entretien

I. Construction durable

1. Que signifie pour vous la construction durable ?

II. Choix d'un produit de construction

2. Sur quels critères vous basez-vous pour le choix d'un produit de construction ?
Qu'allez-vous regarder et à quoi allez-vous accorder de l'importance ?
3. Veuillez noter ci-après ce qui orientent votre choix pour un produit de construction ?
Notez de 1 à 5 sachant que 1 n'est pas important et 5 très important.

	1	2	3	4	5
L'habitude, j'ai toujours fait comme ça					
La satisfaction : je l'ai déjà appliqué et j'en suis content					
J'ai une bonne connaissance du produit					
Son coût					
Les recommandations de mon distributeur					
Sa performance environnementale					
Le caractère durable du produit					
· Autres :					

Commentaires :

4. Est-ce important qu'un produit soit durable ? Pourquoi ?
5. Comment allez-vous déterminer si un produit est durable ??

6. Un produit durable c'est avant tout un produit qui :

	Tout à fait d'accord	Plutôt d'accord	Ni d'accord ni pas d'accord	Plutôt pas d'accord	Pas du tout d'accord
Dure dans le temps					
Minimise les impacts environnementaux sur tout le cycle de vie.					
Prend en compte l'aspect économique sur le cycle de vie à savoir l'investissement et le coût durant l'utilisation					
Favorise le producteur local					
Satisfait les exigences fonctionnelles et techniques en cherchant une bonne balance environnementale, sociale et économique sur tout le cycle de vie.					
Autres :					

Commentaires :

7. Comment allez-vous déterminer qu'un produit minimise les impacts environnementaux ?

	Tout à fait d'accord	Plutôt d'accord	Ni d'accord ni pas d'accord	Plutôt pas d'accord	Pas du tout d'accord
Je regarde s'il possède un label ou une certification environnementale					
Je regarde s'il contient des matériaux recyclés					
Je regarde s'il contient des matériaux renouvelables					
Je regarde sa performance sur tout le cycle de vie					
Je regarde sa contribution à l'analyse du cycle de vie du bâtiment					
Je fais appel à un bureau d'étude/conseiller externe					
J'utilise un guide de choix de matériaux selon leur performance environnementale.					
Autres :					

Commentaires :

III. La communication des informations environnementales sur les produits de construction

8. Que pensez-vous de l'information donnée par les producteurs sur les produits de construction liée à la performance environnementale ?

9. Que pensez-vous de la manière dont les producteurs communiquent sur leurs performances environnementales ou la performance environnementale de leurs produits ?

	Trop	Assez	Pas Assez	Pas du tout
Les producteurs communiquent				

Commentaires :

	Très Efficace	Efficace	Ni efficace ni pas efficace	Peu efficace	Pas du tout efficace
Le contenu du message est					

Commentaires :

	Tout à fait d'accord	Plutôt d'accord	Ni d'accord ni en désaccord	Pas d'accord	Pas du tout d'accord
En communiquant sur la performance environnementale, les producteurs contribuent à faire avancer les choses.					

Commentaires :

10. Est-ce que ça vous intéresse qu'un producteur communique sur la performance environnementale de ses produits ? Est-ce important pour vous ? Pourquoi ?

11. Quel est le meilleur moyen de communiquer sur la performance environnementale selon vous ?

12. Par quels moyens vous informez-vous de la performance environnementale d'un produit ?

	Tout à fait d'accord	Plutôt d'accord	Ni d'accord ni pas d'accord	Plutôt pas d'accord	Pas du tout d'accord
Brochures					
Revue Spécialisées					
Salons professionnels					
Certifications/labels					
Recommandations du distributeur					
Autres :					

Commentaires :

IV. Certifications environnementales

13. Que signifie pour vous une certification environnementale ?

14. Trouvez-vous important qu'un produit possède une certification environnementale ? Pourquoi ? Si oui, quels types de certifications environnementales connaissez-vous ?

15. A propos des certifications environnementales

	Trop important	Assez important	Assez faible	Très faible
Le nombre de certifications environnementales est ...				
	Trop restrictives	Assez restrictives	Pas assez restrictives	Pas du tout restrictives
Les certifications environnementales sont ...				
	Tout à fait d'accord	Assez d'accord	Pas d'accord	Pas du tout d'accord
Je souhaite un nombre plus limité de certifications mais plus efficace				
Je pense que les certifications environnementales sont surtout mises en avant par les industriels				
Je pense que les certifications environnementales sont uniquement des arguments marketings mis en place par les industriels				

Commentaires :

16. Est-ce que vous préférez une approche qui tient compte de l'impact environnemental sur tout le cycle de vie et dans son application ou alors une approche qui exprime quelques critères simples sur un produit ?

V. Fiches de déclaration environnementale et sanitaire

17. Connaissez-vous les Fiches de Déclaration Environnementale et Sanitaire ?
(Dénomination européenne : Environmental Product Declaration)

Si oui, passez à la question suivante.

Si non (donner la définition et demander l'avis)

18. Que pensez-vous des FDES ?

19. La présence d'une FDES (EPD) va-t-elle orienter votre choix pour un produit ?
Pourquoi ?

20. Est-ce que les FDES (EPD) sont un bon moyen de mettre en avant la performance environnementale d'un produit ? Si oui, pourquoi ? Si non, que faut-il communiquer ?

Appendix 3: Transcripts

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