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Final report

Liability and insurance regimes in the construction sector: national schemes and guidelines to stimulate innovation and sustainability

Consortium formed by

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and
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"When men find themselves in a new situation they adapt and change. But as long as they hope that things can stay as they are, or be subject to compromise, they are not open to new ideas. What holds us back is the fear of change. And yet, our salvation depends on such change. The only choice we have is between change, by which we will be affected and change, which we would be able to accomplish."

Jean Monnet (Speech, Strasbourg, 12th May 1954)

1. Introduction

1.1. Background of the study

The main goal of the present study is to identify if and in what conditions insurance could play a role in promoting sustainable development and implementation of innovation in the construction sector.

The name of the study (ELIOS) reflects this objective as stated by the Commission: *"Liability and insurance regimes in the construction sector: national schemes and guidelines to stimulate innovation and sustainability".*

ELIOS stands for "European Insurance Liability Organisation Schemes". Further on in this document we may refer to the research project and to the research team using expressions "the ELIOS project" and "the ELIOS team".

The scope of the study defined by the European Commission also required taking into consideration other key issues, especially access of small and craft enterprises to the market, internal market of services, cost/benefit effects for construction and insurance markets, risk and liabilities assessment and management, good practices and consumer protection.

Figure 1 - Analysis criteria

The reasons why insurance has an impact on the matters illustrated above are explained in paragraph 1.3.4.

Obviously sustainability should be placed in the centre of our considerations, as a main focus of an integrated approach due to its critical importance to the economy and environment of the European and global market.

Reminder of the background of the study and of EU sustainable policies framework

The ELIOS project is a part of the implementation of the Lead Market Initiative and of a Pilot Project supported by the European Parliament to facilitate access to insurance by building contractors, especially the self-

employed and small firms, in order to stimulate innovation and the promotion of eco-technologies in the European Union.

Lead Market Initiative:

The goal of the Lead Market Initiative is to create market conditions which would stimulate development and implementation of innovative products, services and technologies in the economic sectors in which a high development potential exists but is currently constrained by regulatory and other obstacles.

In the document "Lead Markets: initiative for Europe" issued by the European Commission on 21/12/2007 sustainable construction was identified as one of six European Lead Markets[1].

The construction market has both a major strategic and societal interest for the European Union economy and an important potential in terms of innovation and of sustainable development. Market fragmentation and other obstacles are considered as factors holding back innovation in the market but it is also estimated, that such factors can be overcome by public intervention.

Lead Markets Initiative is defined as a *"coordinated action at policy level"* involving a combination of supply-side policies with demand-side instruments: regulation, standards, intellectual property rights, procurement, awareness, risk capital etc.

In parallel to the Lead Markets Initiative other actions also linked to sustainable construction are undertaken in the fields of energy and environmental technologies.

It is useful to bear in mind a number of regulatory initiatives directly and indirectly concerning sustainability issues related to construction assets, the construction activity or the construction product industry, such as EU Directives and member States legislations, for example the Building Energy Performance Directive (2002/91), the Energy Services Directive (2006/36), the Waste Framework Directive (2006/12), the Drinking Water Directive (98/83/EC), the Construction Product Directive (89/106/EC).

In addition to regulatory measures, alternative initiatives are being developed to complete regulation with voluntary building codes setting a framework for the industry to evolve towards achievement of sustainable construction goals. For instance, the introduction in the UK of the Code for Sustainable Homes in December 2006[2], which defines six levels for raising the environmental performance standard of new homes, with a specific target of zero net carbon emissions post-construction by 2016, has provided indications to the house building industry how sustainable homes can be built on large market scale. A similar approach, introducing the standards of green buildings has been implemented in France by *Association pour la Haute Qualité Environnementale (ASSOHQE)* with "Haute Qualité Environnementale" label. As similar initiatives are being developed by different organisms in Europe and in other countries, a non-profit organisation (Sustainable Building Alliance: SB Alliance[3]) has been created to help the comparison of approaches and the elaboration of reference environmental quality assessment procedures.

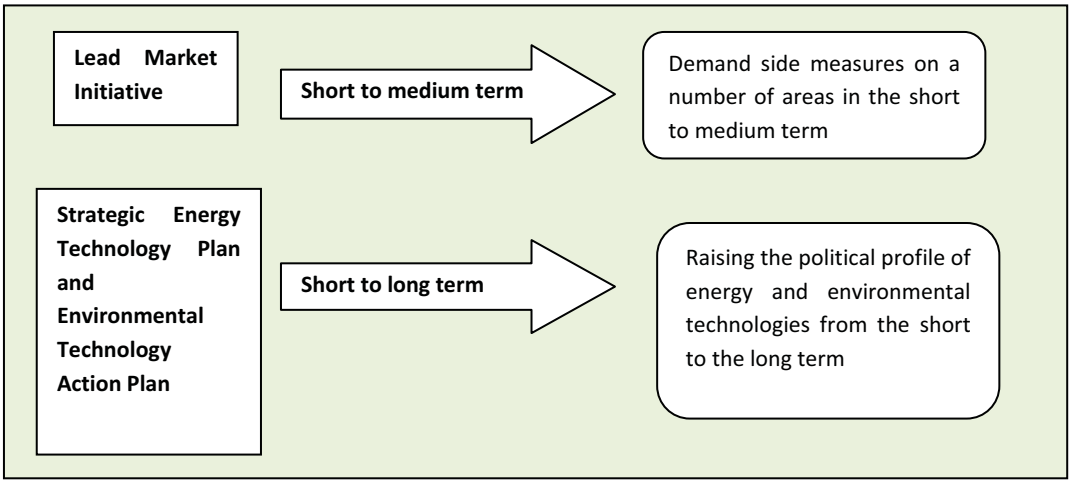
[1] A Lead Market Initiative For Europe : http://ec.europa.eu/enterprise/policies/innovation/policy/lead-market-initiative/

[2] Code for Sustainable Homes: http://www.communities.gov.uk/planningandbuilding/buildingregulations/legislation/codesustainable/

[3] SB Alliance www.sballiance.org

The combination of the strategies above can be resumed by the following illustration:

Figure 2 - Combination of sustainable construction initiatives on the EU level



Based on "Accelerating the Development of the Sustainable Construction in Europe" report of the taskforce for the sustainable construction composed in preparation of the communication "A Lead Market Initiative for Europe" {COM(2007) 860 final}
http://ec.europa.eu/enterprise/leadmarket/doc/sustainableconstruction_final.pdf

Strategic Energy Technology Plan

The Strategic Energy Technology Plan is derived from the Energy Policy for Europe[4] dedicated to accelerating the development and deployment of cost-effective low carbon technologies. As observed by the European Commission[5], it will be required to reduce the cost of "clean energy" and to encourage the EU industry to develop and implement low carbon technologies in order to meet the targets of the Energy Policy for Europe objectives adopted in 2007.

It is considered that at present new technologies suffer from a number of structural weaknesses, which hamper their market penetration; they are faced with a long product development cycle until they can be implemented on mass-market scale due to the necessary investment levels as well as technological and regulatory constraints. Moreover, they tend to be more expensive than traditional energy solutions; therefore the benefits of deployment of innovative technologies are currently more obvious from the society point of view rather than for the buyers. As a result, at present *"there is neither a natural market appetite nor a short-term benefit for such technologies".*

The Energy Policy for Europe aims in creating more favourable market conditions for development and implementation of low carbon technologies in transport, buildings and industry in order to make sure that the available technology opportunities can be *"turned into business opportunities".* It is intended that both public policy and market-based instruments will be deployed in order to reach the above goals and to encourage demand for low carbon technologies. The examples of existing measures include Energy Efficiency Action Plan

[4] "An Energy Policy for Europe" Communication from the Commission to the European Council and the European Parliament {SEC(2007) 12}
http://ec.europa.eu/energy/energy_policy/doc/01_energy_policy_for_europe_en.pdf

[5] A European Strategic Energy Technology Plan (Set-Plan) "Towards a low carbon future", Communication from the Commission to the Council, the European Parliament, the European Economic and Social Committee and the Committee of the Regions, November 2007, COM (2007) 723 final
http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2007:0723:FIN:EN:PDF

as well as directives on Eco-design, Energy Labelling of Energy Using Products, Energy Services and Building Performance.

The Commission considers that the main axes of policies in favour of low carbon technologies should consist of reinforced research with the view to lower cost and improve performance and, on the other hand pro-active support measures dedicated to stimulating the demand and addressing barriers that discourage diffusion of these technologies.

The role of the private sector in this process is essential and the Commission considers that the industry should set up strategic alliances in order to *"share the burden and benefits of research and demonstration"* and that *"The industry should also join forces to take a more pro-active stance on the elaboration of global regulations and standards and to overcome the often complex issues surrounding the public acceptance of new technologies".*

The Strategic Energy Technology Plan is intended to *"focus, strengthen and give coherence to the overall effort in Europe"* with a view to accelerating innovation in the field of low carbon technologies in order to provide a new joint strategic planning, a more effective implementation, and increase in resources and a new reinforced approach to international cooperation.

Environmental Technology Action Plan

The Environmental Technology Action plan was adopted in 2004 by the European Commission with the view to promote eco-innovation and use of eco-technologies. The goal of this initiative consists in creating a favorable market perspective for development of eco-technologies through a combination of several measures such as:

- increase in research on environmental technologies,
- creating technology platforms dedicated to promoting a particular type of technology,
- environmental technology verification mechanisms in order to increase public confidence in environment-friendly technologies and to facilitate diffusion of innovative technologies, in particular for the craft and small firms,
- performance targets for environmental performance,
- mobilisation of financing i.e. enhancing financial instruments such as grants, loans or guarantee mechanisms, which could support investment in environment friendly technologies,
- market based instruments consisting on targeted economic incentives promoting energy efficiency investments,
- "green" public procurement,
- awareness raising and training in order to raise public awareness on environmental technologies and to develop know-how,
- supporting eco-technologies in developing countries and promoting foreign investment,

Pilot project:

As noticed by the European Commission, 99% of building companies are small and medium enterprises. In spite of the major impact of these enterprises on employment in the EU, their contribution to GDP creation in Europe as well as their potential impact on innovation and sustainability, this category of market operators still suffers from significant constraints which restrict the distribution of innovative technologies.

According to the EU Official Journal of 13/03/2008 it is considered that one of the most important constraints is the difficulty faced by these enterprises in obtaining appropriate insurance cover for construction work involving the use of innovative technologies.

In order to address the difficulties above the pilot project entitled, "To facilitate access to insurance by building contractors, especially the self-employed and small firms, in order to stimulate innovation and the promotion of eco-technologies in the European Union," was proposed by the European Parliament.

In the framework of the above pilot project, it was proposed that, during a limited period of time, the access to insurance for small construction companies using eco-technologies should be facilitated. It was also proposed to analyse a possibility to affect the public funds, which would be made available to insurers or to reinsurers in order to help them to deliver insurance guaranties for small enterprises using eco-technologies.

Following the propositions above, the European Commission decided to launch the present study in order to analyse the feasibility of the propositions presented or of possible alternative solutions.

1.1.1. Call for tenders

It is useful to remind the key dates related to issuing of the Call for Tenders of the present research on "Liability and insurance regimes in the construction sector: national schemes and guidelines to stimulate innovation and sustainability" by the European Commission and to the award of the Service Contract to the Consortium of CEA and CSTB:

- 28 May 2008: Invitation to Tender ENTR/08/007 of 28/05/2008 issued by the European Commission;
- 10 July 2008: Submission of the Tender Offer by the Consortium of CEA and CSTB;
- 19 November 2008: Signature of the Service Contract N°SI2.ACPROCE021941000 between the European Commission and the Consortium;
- 5 May 2009: Presentation of the ELIOS progress report;
- 24 July 2009: Amendment N°1 to the Service Contract (administrative modification);
- 30 November 2009: Amendment N° 2 to the Service Contract granting a 2 month extension of the deadline of performance of contractual tasks;
- 28 February 2010: Submission of the preliminary version of the final ELIOS report;
- 18 March 2010: ELIOS Workshop, presentation of the findings and conclusions of the ELIOS research;
- 30 April 2010: Submission of the definitive version of the final ELIOS report;

1.1.2. Previous studies

Liability and insurance in construction in the European Union has been of interest for several years and a considerable number of studies on this subject have been carried out.

In fact, two main periods may be distinguished, during which the approach as well as reasons for studying this subject were different.

Firstly, during the 1980s and 1990s, study of C. Mathurin's [6] on liabilities, guarantees and insurances as well as widely known study of the GAIPEC[7] group and COPAL's study[8] were pursued in the context of a great interest in harmonisation of liability and insurance regimes at the European level at that time. Subsequently, the idea of European harmonisation has been abandoned and considered as unrealistic due to the complexity and diversity of the national legal and insurance systems.

Following this period the interest in the European studies diminished considerably for some time, however a new attention for this subject started emerging from the 2000s with a growing interest in a more convergent evolution of the national liability and insurance systems encouraged among others by the Internal Market Directive, the Lead Markets Initiative and by the challenges of sustainable development.

Several European and international comparative studies related to various aspects of construction law, construction insurance and building regulations have been published.

The reasons of performing the new European studies were fundamentally different. Unlike the research from the 1980s and 1990s, the new studies were no longer focused on harmonisation. Instead they were driven by the will to achieve a better understanding of the European framework in the matter of liability and insurance, to create conditions facilitating free circulation of goods and services as well as identifing points of convergence between the national regimes across Europe.

Many examples can be highlighted.

The reports of IMIA[9] and SCOR[10] on inherent defects insurance were focused on reviewing existing insurance solutions with the aim of developing insurance offer on a European level rather than harmonising the national regimes.

On the other hand, the comparative study on home warranties by the Japanese Organisation of Housing Warranty[11] has been performed in the context of the legislative reforms in Japan being undertaken at the time. The main idea of this research was to identify the existing home warranty schemes across the world as a

[6] C. Mathurin, *Étude des responsabilités, des garanties et des assurances en vue d'une harmonisation au niveau communautaire*, 1989

[7] GAIPEC, *Liability and insurance regimes in the construction sector*, 1992.
http://ec.europa.eu/enterprise/construction/info/study_liability_insur_regimes_sect_construct.pdf

[8] COPAL, *Éléments pour un droit européen consensuel dans le domaine de la construction*, 1992

[9] IMIA Conference, *Inherent defects insurance*, 2001
http://www.imia.com/downloads/imia_papers/wgp14_2001.pdf

[10] Jean Paul Pirog, Jean Tuccella, SCOR, *Expérience Européenne en Assurance et Réassurance de Responsabilité Décennale,* 2009
http://www.cna.dz/dmdocuments/conference/externe/2009/080609/Exp%C3%A9rience%20Europ%C3%A9enne%20en%20Assurance%20et%20R%C3%A9assurance%20de%20Respons.pdf

[11] Organization of Housing Warranty Japan, *Housing and Home Warranty Programs World Research*, 2005
http://www.ihhwc.jp/sessions/World_Research.pdf

possible inspiration or guidelines. Similarly, the study on building regulations by F.M. Meijer[12] was a response to the increased interest in the building regulations in the other EU Member States due to the ongoing reforms in the Netherlands in this field. The debate in France concerning the regime introduced by "Spinetta law" 1978 has inspired comparative international research on construction liability and insurance by Inspection Générale des Finances[13].

Much attention was also granted to the question of architect's liability and insurance resulting in European studies on this matter performed by Centre d'Etudes d'Assurances[14] and by COAC (Architect's Institute of Catalonia)[15]. In 2009 the Council of Architects of Europe (CAE) launched in cooperation with Centre d'Etudes d'Assurances, an enquiry on the subject of liability and insurance of architects across the EU. Engineering practice has recently been analysed on a European level by ANFOR[16].
The underlying reasons of the above research were the development of architectural and engineering services on cross-border basis and increased needs for information expressed by the professional consultants wishing to work in other Member States.

The idea of international exchange and the resulting concerns of consumer protection in the context of growing volume of cross border construction activities are also present in the reports of Euro-Info Consommateurs[17] and of the European Builders Confederation (EBC)[18]. Interest in consumer protection measures in the housing sector across Europe is also reflected in the study of B. Kohl in Belgium[19].

It is worth bearing in mind that the study performed by the EBC was at the origin of the Pilot Project initiative supported by the European Parliament, entitled "To facilitate access to insurance by building contractors, especially the self-employed and small firms, in order to stimulate innovation and the promotion of eco-technologies in the European Union", and subsequently led to the launch of the ELIOS research.

Some comparative studies have been driven by the interest in good practices existing in the field of building control and of construction qualifications across Europe. The subject of building control has been addressed by Consortium of European Building Control (CEBC)[20] whereas European Construction Industry Federation (FIEC) performed a study on construction qualifications procedures across Europe[21]. National practices related to control of construction quality have been analysed by Agence Qualité Construction[22].

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[12] F.M. Meijer, H.J, Visscher, L. Sheridan, *Building regulations in Europe*, 2002.

[13] Inspection Générale des Finances – Conseil Général des Ponts et Chaussées, *Rapport particulier sur les régimes d'assurance construction dans une vingtaine de pays étrangers*, 2006.
https://www.igf.minefi.gouv.fr/IGF/sections/rapports/regimes_d_assurance/

[14] Centre d'Études d'Assurance, *Etude européenne sur la responsabilité des architectes*, 2004.
http://www.groupe-cea.com/upload/doc_doc/Document_fr/155/SYNTHESE.pdf

[15] Col·legi d'Arquitectes de Catalunya, COAC Internacional, *Architectural Practice Around the World*, 2005
http://www.bak.de/userfiles/bak/bericht%20brussels/UIA/apaw_book_2005_dina4.pdf

[16] Anfor Normalisation, *Feasibility and opportunity to develop a standardization work programme concerning Engineering Consultancy Services*, 2008 http://www1.fidic.org/news/content.asp?ArticleCode=082Pr&Rubrique=Practice&Date=12/12/09&lang=en

[17] Euro-Info Consommateurs, *Les laissés pour compte de la libre circulation des services et des marchandises dans le secteur de la construction: La situation franco-allemand,* 2008, www.euroinfo-kehl.eu

[18] European Builders Confederation, CAPEB, *Faciliter l'Accès aux Assurances des artisans et des petites entreprises du bâtiment pour encourager l'innovation et la promotion des éco-technologies dans l'Union Européenne,* 2007

[19] Benoît Kohl, *Droit de la construction et de la promotion immobilière en Europe*, 2008

[20] Consortium of European Building Control (CEBC), *Building Control Systems in Europe*, 2006.
http://cebc.eu/index.php?option=com_content&task=view&id=119&Itemid=58

[21] FIEC, *Qualifications procedures in Europe* 2008, http://www.fiec.org/Content/Default.asp?PageID=31

[22] Pierre Chemillier, *La Qualité de la construction en Europe, 10e Rendez–vous Qualité Construction, Agence Qualité Construction, 2008*

Furthermore, studies on construction efficiency, competitiveness and influence of EU policies on sustainable construction were performed by Bernard Williams Associates[23], by Davis Langdon Management Consulting [24] and by the University of Manchester[25].

1.1.3. Specificity of the present study: functional approach

The studies quoted above provide valuable elements of information, which have been widely used in the ELIOS report. Even if they remain incomplete in the sense that some countries, in particular the most recent Member States, have not been subject to many comparative studies and only little information is available on their national liability rules, insurance mechanisms or on situation of particular construction professions such as architects, these reports constitute already a very useful documentary base.

They have largely contributed to drafting of the 27 national overviews outlined in the "Special report on liability and insurance regimes in 27 EU Member States" annexed to this report and to the synthesis, which is proposed in Chapter 6 of the report.

However, it should be noted that each of the previous studies has been conducted in a certain context and with concerns different from those which have guided the ELIOS approach. In some cases, the idea was to reflect the conditions of a possible legal harmonisation, in others to analyse one particular aspect of existing systems (quality assessment, specific situation of architectural profession) or to compare one national law with those of the neighbouring countries.

The approach adopted here is original in the sense that it aims to be both comprehensive and functional.

It is comprehensive because it attempts to analyse liability and insurance systems of 27 European Member States in a complete manner that does not neglect their impact on innovation, sustainability, access for small companies to the construction market, quality assessment and cross-border activities.

It is also functional because it favours an approach focused on goals and results obtained by different systems rather than on analysis of legal arrangements and instruments in place.

Let us not forget that in comparative law, it is possible to distinguish between a traditional method, called structuralist, which is concerned primarily with the concepts and legal rules from a point of view, which is somehow "morphological" and an approach, which has emerged quite recently, called functional, which is focused on the results achieved in relation to a specific problem. The main point in this latter approach is to focus the attention on purposes of the legal systems and on solutions, which they have developed as a response to a factual situation.[26] Thus, the functional approach leads to practical questions such as the

[23] Bernard Williams Associates, *Benchmarking of Construction Efficiency in the EU Member States (Scoping Study)*, 2007. http://ec.europa.eu/enterprise/sectors/construction/competitiveness/benchmarking/index_en.htm

[24] Davis Langdon Management Consulting, *Life-cycle costing (LCC) as a contribution to sustainable construction: towards a common methodology*, 2007. http://ec.europa.eu/enterprise/construction/compet/life_cycle_costing/index_life_cycle_en.htm

[25] The University of Manchester, *Analysis and assessment of the elements of certain Community policies that impact on the competitiveness of the construction sector*, 2006. http://ec.europa.eu/enterprise/construction/compet/analysis_assesm_policies/index_analy_assessm_en.htm

[26] B.Kohl « Droit de la construction et de la promotion immobilière en Europe », LGDJ 2008, qui souligne l'intérêt de la méthode fonctionnelle dans ce domain en p. 9.Adde, H.A. Schwartz-Libermann « Droit comparé. Théorie générales et principes »,1978. H.C. Gutteridge « Comparative Law.An introduction to the comparativ method of legal study and research", oct.1946

situation of the property buyer confronted to a damage arising, for example, from a latent defect discovered after handover of the property. What happens in such situations and who, within this large diversity of national construction liability regimes, bears the post-completion construction risks? Whatever the legal rules and market practices of liability and insurance in each of the Member States, some political and regulatory choices have necessarily been made in these matters.

In order to illustrate the difference between the two methods above it is possible to quote the examples of the liability and insurance systems existing in the United Kingdom and France.

A structuralist comparison would lead to a conclusion that the regimes in force in these two countries have nothing in common as common law is applied and almost no mandatory insurances exist in the first case whereas, in the second case, decennial liability governed by codified law and double legal obligation of insurance can be observed.

On the contrary, the functional approach allows highlighting some points of convergence, since in practice, over 90% of buyers of new dwellings in the United Kingdom are covered by guarantee issued by the NHBC, which lasts for a period of 10 years starting from handover of the property.

1.2. Presentation of the study consortium

The contract of performance of the present feasibility study entitled “Liability and insurance regimes: national schemes and guidelines to stimulate innovation and sustainability” has been awarded by the European Commission to the consortium formed of Centre d’Etudes d’Assurances (CEA) and Centre Scientifique et Technique du Bâtiment (CSTB).

CSTB and CEA have been working together for ten years in several fields. For this specific project, we have composed a workgroup that consists of both CSTB and CEA, with active participation of CEA subsidiaries from UK and Belgium.

In order to facilitate communication on the project a multilingual website: www.elios-ec.eu has been created containing information on the work program and progress of research. The website was intended to become an interaction platform between all parties involved in the project. For this purpose an ELIOS e-mail address has been created: info@elios-ec.eu.

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1.2.1. Centre d'Etudes d'Assurances (CEA)

Centre d'Etudes d'Assurances (CEA, www.cea-assurances.fr) assumes the coordinator role of the grouping.

Centre d'Etudes d'Assurances (CEA) is a French limited company specialised in consulting and brokerage in construction insurance field with specialist knowledge of the liability and insurance regimes in the construction sector at a European level.

The following persons have participated in the research on behald of Centre d'Etudes d'Assurances:

Jean ROUSSEL
Gilbert LEGUAY
Pierre COLPAERT
François-Xavier DUSSAULX
Monika TAKUSKA
Doina BUIUC

Laurent KARILA, attorney at law and member of the Paris Bar, who contributed to the analysis of the national liability and insurance regimes.

1.2.2. Centre Scientifique et Technique du Bâtiment (CSTB)

The Centre Scientifique et Technique du Bâtiment (CSTB, www.cstb.fr) is a State-owned industrial and commercial corporative, placed under the administrative supervision of the French Ministry of Housing. It is one of Europe's leading research and evaluation centres. It operates closely with its partners in the building industry such as construction professionals and manufacturers. Its status allows it to be independent of any specific sector of the industry and to lead a multi-discipline approach to innovation and to solving the construction industry's most complex problems.

The following persons have contributed to the research on behalf of CSTB:

Jean-Luc SALAGNAC
Yannick LEMOIGNE
Frédéric BOUGRAIN

1.2.3. Other partners

In addition to the wide network from which the grouping CEA-CSTB benefits, four associated partners, two from legal and two from technical fields, were involved in the research:

- BEITEN BURKHARDT's lawyer firm (Poland) specialized in liability and insurance in the construction sector having locations in the major parts of Eastern European countries. This subcontractor leans on a network of privileged partners (SORAINEN and GIESE & PARTNERS v.o.s.);
- KING'S COLLEGE LONDON (United Kingdom) represented by the Centre of Construction Law and Dispute Resolution. This research department is specialized in law and management relating to the construction industry;
- EIFER – European Institute for Energy Research (Germany). EIFER is a common research institute of Electricité de France (EDF) and Universität Karlsruhe. Its activity is focused on energy and the environment;
- ASM Market Research and Analysis Centre (Poland). The main sector of specialisation is the construction and covers target groups such as investors, architects, producers of materials, execution companies, associations, etc.

The above partners were mainly involved in providing answers to the ELIOS questionnaires for chosen countries and in the work on the Case studies.

1.3. Context of the study

1.3.1. Free movement of goods and services

In European Union law, the **Four Freedoms** is a common term for a set of treaty provisions, secondary legislation and court decisions, protecting the ability of goods, capital, services, people and labour to move freely within the internal market of the European Union. More precisely, they are:

- The free movement of goods;
- The free movement of capital;
- The free movement of services;
- The free movement of persons;

These four freedoms form part of the substantive law of the EU. Although it is not easy to summarize compactly the activities of the European Union, one can define them as the free flow of economic factors, in pursuit of greater prosperity of the states and their citizens. The law of the Single Market plays a key role thereby removing the barriers that member states might otherwise impose on trade originating in other member states.

The four freedoms are fundamental to the common market. Not only goods, but also factors of production can move freely between member states. The single market is intended to be conducive to increased competition, increased specialisation and larger economies of scale. Further, the common market allows goods and factors of production to move to the area where they are most valued, thus improving the efficiency of the allocation of resources.

Free movement of goods

Article 28 & 29 of the EC Treaty

Articles 28 and 29 of the Treaty establishing the European Community prohibit import and export restrictions between Member States. Therefore goods are able to be moved from Member State to Member State without restriction creating what is termed the internal market.

The internal market is the market within the European Union, a market not based simply on the individual Member States but across all Member States.

Common Standards

Following the abolition of import and export restrictions between Member States manufacturers of goods, all work to common standards which are accepted throughout the European Union.

This mutual acceptance of testing and certification means that goods only need to be certified in one Member State for them to be accepted across all Member States.

This also means that it is impossible for individual Member States to impose restrictions over and above what is required as the European Standard. This means that manufacturers can now produce their goods to a certain specification safely in the knowledge that they will be accepted throughout the European Union.

Benefit for Consumers

Differing tax rates in various Member States have the effect of discouraging or encouraging consumers to purchase products in another country rather than in their own Member State. For example it is common for people from some Member States to travel to neighbouring countries in order to purchase high quantities of alcohol taking advantage of the lower excise duties.

Consumers are able to do this in relation to goods that are for their own personal use.

Countries with the higher excise tax are resistant to this benefit for consumers and wish to make it illegal but currently the ability to purchase goods in this manner is guaranteed by the freedoms of the European Union.

With the way the internet has revolutionised the way we shop it has become increasingly easy for consumers to purchase products from other Member States.

How is the Free Movement of Goods protected?

Directorate General for Enterprise and Industry

The Directorate General for Enterprise and Industry is put in place by the European Union in order to contribute to the design, implementation and improvement of regulatory policy in order to make the Single Market work better by removing existing barriers to trade and avoiding the creation of new ones.

The Directorate General has the following specific tasks to undertake:

- Monitor new legislative proposals by Member States which may cause technical barriers;
- Ensure that Member States do not create barriers or maintain barriers to intra community trade – relying of Articles 28 – 30 EC Treaty;
- Enacting specific secondary legislation in relation to certain products;
- Enacting specific secondary legislation in relation to such questions as tackling late payment in commercial transactions;
- Monitoring the application of Community Law;

All the above initiatives aim at producing a business and consumer friendly internal market.

Application of Anti-Competitive Legislation

Agreements to prevent parallel imports between Member States are expressly stated to fall foul of Article 81 EC which prohibits anti-competitive agreements between parties.

Conduct by a company occupying a dominant position on the market which effectively prohibits parallel imports between Member States will be seen as an abuse of that dominant position.

Free Movement of Services & the Internal Market

Article 56 of the EC Treaty guarantees companies from any European Union Member State to be able to establish themselves in another European Union Member State and provide services on the territory of another European Union Member State or on that one which they are established in.

Companies established in one EU Member State are therefore able to provide services in any of the other EU Member States. Making the single market work for the services industry is a key requirement.

The internal market is the market within the European Union, a market not based simply on the individual Member States but across all Member States and is achieved through the free movement of services and the free movement of goods throughout the European Union.

Benefits of the Internal Market

Since the creation of the internal market and in the ten years following the first completion of the first Single Market programme in 1993, the following tangible benefits were recorded:

- ✓ 2.5 million extra jobs created due to the removal of national barriers;
- ✓ Increase of wealth in the single market up to EUR 9 billion – EUR 6,000 per family;
- ✓ Increased competition – better prices and better products available for consumers;

Barriers to trade between Member States

Central to the creation of the internal market is the removal of barriers affecting trade between European Union Member States. For example certain Member States imposing conditions on the provision of services or goods meaning that it is difficult for providers of services or goods from other Member States to enter the market in that Member State would be seen as a significant barrier to trade.

Following the creation of the internal market there have been significant improvements in relation to the free movement of goods but there has been less development in relation to the free movement of services.

The following are reasons why it is still difficult for service providers to establish themselves in other Member States and provide services in those Member States:

- Requirements relating to authorisation or professional qualifications;
- Restrictions on the use of a certain legal form for the service provider or on the partnerships between different professions;
- The number of authorisations required;
- The length and complexity of the procedures;
- Discretionary powers of local authorities and duplication of conditions already fulfilled in the Member State of origin;
- Problems which are both directly or indirectly linked to the selling of services across borders between Member States also arise as a result from differences in contract law, fixed or recommended prices for certain services, requirements relating to payment and reimbursement of VAT subject in different Member States to different rates, classification systems and procedures.

Consequently it is much simpler to sell goods in the territory of another European Union Member State than it is to establish and to provide services there.

Effect on Consumers

Lack of transparency in relation to services provided and lack of confidence in service providers from other Member States often prevent consumers, who account for a large part of the demand for services, from enjoying the full benefits of the Internal Market.

There is often a lack of information available to consumers fully detailing the requisite workings of the internal market and the services made available to them from other European Union Member States.

A key component of the Internal Market is enabling consumers to get the full benefit of all the services available to them at the best price which is something which is not always realised.

Effect on SME's

SME's or Small or Medium Sized Enterprises are companies which are very prominent in the service industry but are also the companies which struggle the most when faced with barriers to trade between European Union Member States.

They are often hit much harder than their larger rivals, in relation to matters such as legal assistance costs in relocating to another Member State which are often fixed and not proportionate to the size of the company. As a result, SMEs will either be persuaded against cross-border activities altogether or will be put at a clear competitive disadvantage compared to domestic service operators.

SMEs may also become an attractive target for acquisition by larger companies because of their significant local knowledge, experience and innovation potential.

The above are just some of the problems that are often associated with trying to create the European Union internal market.

1.3.2. Sustainability in construction: a growing concern

The relatively stable climate, though variable, over the last six thousand years has very likely favoured the development of societies and correlatively of the built environment. These anthropogenic developments have been huge and fast during the last hundred years. The associated production of green house gases (GHG) has been increasing as well as the concentration of these gases in the atmosphere. There is less and less doubt that this will contribute to impact climate during the next decades and centuries as concluded by the IPCC experts in their most recent report (IPCC, 2007). A major issue in such a perspective is the development of much less energy consuming buildings. This strong requirement has to be fulfilled whilst fossil energy reserves tend to decrease and world population experiences an exponential growth.

As such perspectives may clearly not be sustainable, "sustainable development" has been perceived for some years as a major issue and challenge for the XXIst century. Moreover, construction is one of the major GHG contributors and buildings are absolutely necessary for nearly all human activities.

In this context, the EU has progressively recognized that sustainable construction had to be at the top of the agenda to reach its priority objectives: a low-carbon and resource efficient economy:

- In 2002 the directive on energy performance of buildings (Directive 2002/91/EC) indicated that the residential and tertiary sector, the major part of which is building, accounts for the largest share of the total EU final energy consumption (42%) and produces about 35% of all greenhouse emissions. It

requested the building sector to take actions towards improving its energy efficiency in order to take part in the action plan on energy efficiency launched by the European Union. It required that Member States regularly review the minimum energy performance requirements for new and existing buildings.(EC, 2002)

- In 2006 the directive on energy end-use efficiency and energy services did not target the building sector, however several elements on energy performance contracting, energy audit, metering and informative billing of energy consumption directly concerned the sector (directive2006/32/EC) (EC, 2006).

- In 2007 the lead market initiative for Europe was launched. Six markets were considered as the targets of this initiative: eHealth, protective textiles, sustainable construction, recycling, bio-based products and renewable energies. According to the European Commission, the "*market area of sustainable construction involves environmental concerns (e.g. efficient electrical appliances and heating installations), users' health aspects (e.g. in-door air quality) and issues of convenience (e.g. related to elderly persons' independence). It encompasses developing sustainable solutions for residential and non-residential buildings as well as in infrastructure assets*."

Public and private actors are aware that actions on building will have the largest impact on the economy. Actions will have an impact on the environment, the economy and the society. Indeed construction, renovation and maintenance of buildings contribute 10 to 40 percent of countries GDP. The share of environmental technologies and eco-innovation in the economy is also growing. A study carried out by the French Department of Economics, Finance and Industry (2006)[27] indicates that sustainable issues will span transversely the building and construction industry. This will concern the integration of life cycle costs (from the design to the demolition of a building), the reduction of energy and water consumption, recycling materials and the impact of the building on the health of its inhabitants.

Consequently policies towards sustainable construction will spur the economy and have positive social impact (better housing and clean energy and water - UNEP, 2009).

1.3.3. Higher building performances achievement: a renewed challenge

Sustainable buildings are expected to demonstrate higher performances than that of ordinary buildings. These expectations concern a great number of issues during the life cycle of buildings such as lower energy consumptions, better environmental performances and lower operating and maintenance costs.

The construction industry therefore faces new challenges that call for a shift in many aspects of the traditional building process. Some of the technical as well as organisational and contractual issues linked to these challenges are briefly addressed in this section.

<u>Technical issues</u>

- Improved construction process

[27] Ministère de l'Economie, des Finances et de l'Industrie (2006), *Technologies clés 2010,* Les Editions de l'industrie, Paris

Today predominant construction processes inherit centuries of former development. Making the step from present to higher performances requires a thorough revision of these traditional processes in order to address all details that may hamper such achievement. Too many ways to reach such challenging objectives are open according to local context to present an exhaustive list. Often mentioned examples are a more intensive prefabrication, a more demanding quality control management, performance monitoring during site and exploitation phases.

- Environmental impacts

The major impacts of the construction industry on the environment (intensive use of natural resources, massive amounts of solid, liquid and gaseous wastes) have been acknowledged. Many initiatives are being developed in order to limit these impacts and mitigate their consequences. Here again, it is not possible to make an exhaustive list of these initiatives but materials recycling, renewable energy, low carbon content are corresponding key words.

- Technical and environmental assessment

Initiatives taken to develop improved performance and environmental friendly construction processes and products generate innovations. Information on these products and processes is needed for construction stakeholders use these innovations in the best conditions and evaluate their liability for a given project according to the local context. Though training of involved stakeholders is not directly addressed by assessment procedures, this is nevertheless a key issue for the successful use of these innovations.

<u>Organisational and contractual issues</u>

- Performance-based building (PBB)

PBB is perceived as a shift from traditional prescriptive approaches. “In the prescriptive approach, the building parts are described, specified and procured, resulting in a building with an implicit set of attributes. In the performance approach, the criteria that define the level of performance required of the building attributes are defined, described or specified, and many combinations of different building parts can be innovatively created and/or procured for which it can be demonstrated that the specified attributes will satisfy the required level of performance” (Sexton and Barrett, 2005, p.143).

- Public Private Partnerships (PPP)

PPP is a shift from conventional procurement process. Under this new scheme, design, build, finance and operation are transferred to private sector partners. Public authorities are not anymore the owner of the facility. They become the tenants. Consequently their role during the project delivery and the contract life-time is altered. Fees are paid by the public authority to cover finance, construction and operating costs. Payments are made according to the quality of the service delivery which is judged on performance indicators. After the specified time, the ownership of the facility returns to the commissioning authority for continued operation.

- Energy performance contracting (EPC)

EPC is *“a contractual arrangement between the beneficiary and the provider (normally an ESCO) of an energy efficiency improvement measure, where investments in that measure are paid for in relation to a contractually*

agreed level of energy efficiency improvements". An "energy service company (ESCO) is a natural or legal person that delivers energy services and/or other energy efficiency improvements and on the meeting of the other agreed performance criteria" (Directive 2006/32/EC).

The key issue with this move towards higher building performance is how the performance is measured and guaranteed and who is liable in case of poor performance. For example in PPP projects Key Performance Indicators (KPI) are established according to the expectations of public authorities. In case of poor performance or buildings unavailability the payments to the private partners (usually a consortium gathering a financial organisation, a contractor, facility managers – hard and soft solutions) can be reduced. This is a rather challenging objective as the influence of the building users also has to be taken into account in the performance evaluation.

1.3.4. The place of insurance: increasingly a regulatory role

In the call for tenders specifications of this study the European Commission has given rise to an original question about the role of the insurance sector and its impact on construction activities. Why and how could insurance schemes possibly be involved in stimulating innovation and sustainable development in construction? It may be natural to ask whether it is the role of insurance to ensure such a function.

We feel that the answer could be clearly affirmative, provided that the terminology is precisely defined. Obviously, the question here is not about considering the insurance sector as a potential accelerator facilitating the commercial development of innovation and sustainability. However, on the other hand, it is impossible to neglect the growing impact of the insurance on construction activities. Our research has revealed that insurance does indeed playa regulatory role in some national systems.

This tendency is particularly true in the countries where insurance is systematically taken out, either as mandatory by law, or as a part of market practice requirements. In such cases, the role of risk selection and control by the insurers may affect (and it does indeed affect) the choices of products, methods of design and performance of construction works.

Since a certain level of consumer's protection is expected and considered as normal, obviously the choices made by the insurance sector have an impact on innovation and sustainable solutions. If insurance is not involved in the evolution of construction activities, we run the risk of seeing a gap appearing between the protections wished and the protections provided.

Similarly, being involved in the methods of risk and quality assessment, the insurance sector may have, as a consequence, a considerable influence on the access of small and craft firms to a given national market.

For exactly the same reasons, the insurance sector may have a significant impact on cross borders activities (see 2.3 on Diversity of national insurance systems).

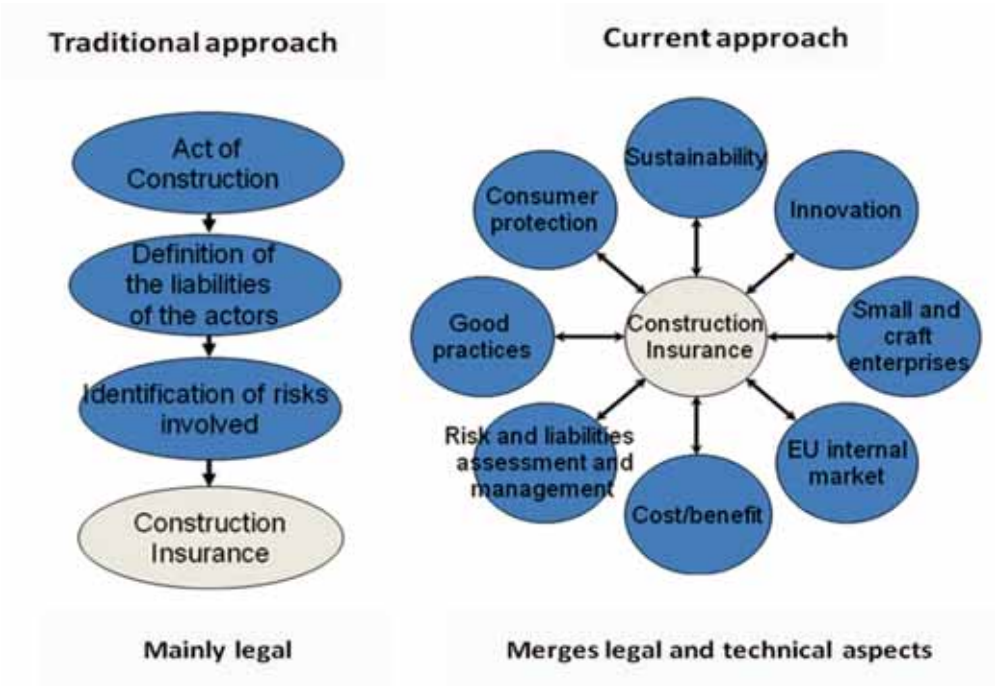
In other words and schematically, it is possible to distinguish between a traditional approach of the role of construction insurance and a new "sustainable" approach.

Traditionally, the insurer was supposed to be situated at the last link of the chain, covering or not the risks generated by the construction activities. That is certainly the reason why the approach of insurers was mainly juridical (liability oriented).

Today, as a result of recent evolutions, there is an obvious interaction between the choices made by insurers who are increasingly interested in technical knowledge and different aspects of the construction activities.

This new relationship is illustrated below:

Figure 3 - Role of insurance; traditional and innovative approach



The question here is not about formulating judgments on this development but rather about highlighting its existence and analysing possible consequences of involvement of the insurance sector in risk assessment and in favoring construction quality, not forgetting the necessity of consumers' protection.

To confirm this tendency from a larger perspective we would like to recall the study performed by Organization of Housing Warranty in Japan on 38 home warranty schemes in the world[28].

Such a question was raised by Mr Kohei Matsumoto - Professor at the Department of Real Estate, Meikai University in Japan and leader of the research team of the above study. Adopting without hesitation the idea that, in the context where public authorities often chose to limit their involvement estimating that the private sector has much more in depth knowledge in the matter, he states that the insurance industry, as an actor naturally concerned with quality and risk, may become a form of a "small government", playing the role of a regulator within construction activities: "*One of the most important subjects in the free nations is to establish a small government. This policy is based on the market principle. According to this principle, adjustment of the various activities of the human beings brings about better results by markets than governments*".

[28] Organization of Housing Warranty Japan, *Housing and Home Warranty Programs World Research*, 2005 http://www.ihhwc.jp/sessions/World_Research.pdf

1.4. Contributions and acknowledgments

The ELIOS team had the pleasure of meeting and contacting various personalities during the progress of this research, and we would like to express our thanks, particularly to the persons indicated in Annexe III, for the quality of exchanges and of information provided to us, all of which have largely contributed to our reflections and to our choice of orientations analysed in this report.

1.5. Work programme

The work programme will include at least the following elements:

a) To critically review the national systems in the EU-27 related to the requirements to insure the liability of market actors in construction projects (clients, architects, consulting engineers, contractors, technical auditors, etc.) with a view towards the achievement of an EU Internal Market for services.

Based on existing studies and ongoing work in EU federations related to the construction sector, in particular those mentioned in section 1 of these technical specifications, and on other information sources which will be defined in the bid, the contractor will clarify the liability of each actor intervening in a construction project and appraise whether these liabilities are clearly defined in regard to the national law. The contractor will assess to what extent insurance premiums are proportional to the services provided by the market actors and to the duties and liabilities they endorse, taking into account the specific situation in each Member State. The review will also provide elements to understand how insurance solutions work or would work in case of a cross border provision of construction services and if the limited availability of insurance cover for such case could be perceived as an obstacle to the development of the Internal Market.

b) To assess the impact of the insurance regimes on consumer protection, the competitiveness and the sustainability of the construction sector, and the economics of the insurance market, including the issue of administrative cost and burden for the market actors concerned and an analysis of related cost-benefit for them.

The contractor will provide key information about the structure and the functioning of the insurance market relative to construction services and identify the criteria which lead to different premium rates and financial caps on liability across the EU. Particular attention will be given to how the risks inherent to construction projects are assessed in various contexts, how the insurance premium and the financial cap are determined accordingly and how risk management is ensured at different levels (qualification, resources, etc.) and at different stages of the project (from early design phase till the acceptance of works). Moreover, the contractor will appraise how the European standardization activity on construction products and the energy/environmental performances of buildings is taken into account in this process. Based on this information, the contractor will assess the extent to which the requisites to insure construction risks could evolve and the corresponding cost-benefits for the consumers, the supply chain and the insurance sector. In doing so, the contractor will take into account the recent proposal of the Commission for a directive on the solvency of insurance companies ("Solvency II draft Directive") which covers among others a requirement to align the underlying capital with the risk an insurance company is exposed to.

c) To identify insurance schemes and good practices that could help especially craft and small construction enterprises to exploit innovative solutions for sustainable construction and to adopt responsible management.

Based on the review and the assessment in points a) and b) above, the contractor will identify existing schemes and/or propose new developments which could serve as a good basis for sustainable construction, responsible management and proper risk assessment. This would cover also label schemes for firms adhering to good standards in particular in terms of environmental protection, health and safety, and training, or possibly the development of new appropriate insurance cover or reinsurance schemes. The contractor will define in a practical way the criteria considered for the identification of the schemes and the qualification of "good practices", the effects on consumer protection, the supply chain competitiveness and the economics of the insurance sector, as well as the mechanisms in place to ensure risk assessment.

d) To make concrete recommendations about the extent to which the European Commission should support the formation and the promotion of such insurance schemes in the Member States, including legal, administrative, financial and management aspects.

The contractor will assess the relevance for the European Commission to support the formation and the promotion of some of the insurance schemes and of good practice identified in point c) above and make accordingly concrete recommendations about among others the subject matter and the scope, the instruments to be implemented, their financial envelope and period of validity, the intermediate bodies to be used in the administration and the management of the instruments, the eligible beneficiaries and the implementation modalities. In doing so, the contractor should take into account the general principles of subsidiarity and simplification in administrative procedures.

e) To contact a representative range of public and private stakeholders of the construction and of the insurance sectors[5] at relevant levels[6], in order to know their views under a), b), c) and d). The results of these contacts will be assessed and presented in a well-structured way in specific part of the final report or annex to it.

f) To participate before the end of the 15-month duration of the tasks in a one-day evaluation and validation workshop to present the draft results of the work undertaken. The contractor would ensure the participation of 2 representatives in the workshop, and draw up and forward to the Commission detailed minutes of the workshop within one week following it.

g) To provide a progress report and a final report as specified in point 4.2.

The Commission will ensure general supervision and guidance of the study through a Monitoring and Steering Group chaired by the Commission and including representatives of relevant Commission services, Member State representatives and other stakeholder experts invited by the Commission. It is planned to hold three meetings of the Group. The contractor shall ensure the participation of two representatives in these meetings and draw up detailed minutes to be forwarded to the Commission, within two weeks following the meeting in question.

2. The scope of the study

The Commission has launched the present feasibility study to provide the basis for developing an EU wide framework for the promotion of insurance schemes which could stimulate the uptake of innovative and sustainable solutions in construction projects as well as the adoption of responsible management in construction companies, in particular in craft and small firms.

The specific aim of this approach is to identify the conditions under which insurance schemes could support the uptake of innovative and sustainable solutions in construction projects, to clarify the overall benefits/effects of insurance on consumer protection, the competitiveness of those involved in the supply chain and the economics of the insurance market, as well as to assess whether and how the EU could play a role in promoting best practice in this area and/or the formation of pilot schemes.

The scope of this feasibility study does not include an examination of a possible harmonisation of the liability and insurance systems across Europe, although it might provide key elements for understanding the issues related to the development of an Internal Market for construction services.

In the call for tenders for the present study the Commission indicated a number of concerns, which must be taken into consideration and stated that "EU wide framework" being a subject matter of this study must follow the framework of European policies and particularly take into consideration the goals of the Lead Market Initiative and of the Pilot project in order to respond to the following concerns:

- ✓ Promoting innovation, sustainability and eco-technologies;
- ✓ The idea that insurance would be a driving force in the promotion of innovation, sustainability and eco-technologies;
- ✓ The issue of accessibility to and practicability of insurance and consequently of its cost; the relationship between a) the cost of insurance and the liabilities and duties of the market actors as well as b) the cost of insurance premiums and the guarantees provided in order to cover responsibilities of those involved in construction;
- ✓ The importance of guidelines encouraging the development and prosperity of craft and small firms;
- ✓ The issue of consumer protection;
- ✓ The desire to develop the Internal Market and to facilitate cross-border projects;
- ✓ The competitiveness of European actors in the international market;
- ✓ Adopting responsible management in construction companies, in particular in craft and small firms;
- ✓ Promoting good practices among construction companies;
- ✓ Training and promoting schemes in respect of principles of subsidiarity and simplification of administrative procedures;
- ✓ Promoting initiatives of market stakeholders;

We have understood from the approach of the Commission, with which we fully agree, that the issue of construction insurance needs to be analysed as a part of larger framework of considerations and that construction insurance itself should be seen as an actor and stakeholder of construction industry.

The main purpose of the study is to achieve a better understanding of national liability and insurance regimes of the EU Member States and to identify insurance schemes, which could stimulate the uptake of innovative and sustainable solutions in construction.

The following sub-chapters define the key terms of the proposal: "**Liability and insurance regimes** (2.1) in the **construction sector** (2.2.): **national schemes** (2.3) and guidelines to stimulate **innovation** (2.4) and **sustainability** (2.5)".

2.1. Definition of liability and insurance regimes

As far as we are aware, there is no definition of what constitutes an insurance regime, although we imagine that this concept includes both the object of the insurance as well as the way it works.

The insurance contract could be defined as an arrangement by virtue of which the insurers, in exchange for a payment of a premium, provide another party with an insurance cover in case of unforeseen event. However, definitions of insurance might be different in each Member State. Therefore we would rather not define the term. We should specify that there are different kinds of insurance which can be distinguished both by the way they work and by their object.

It is possible to distinguish the following main types of insurance: liability insurance and property damage insurance.

Liability insurance is a wide term a wide term that encompasses several forms of insurance (eg products liability, general liability, professional indemnity, employers' liability etc.). Generally speaking, an insurance against liabilities creates a system of risk financing designed to protect the policyholder, or insured, from the risks of liabilities imposed by third-party claims or lawsuits that fall within the scope of the respective insurance policy.
This kind of insurance, especially when it becomes compulsory, tends also to be used as a protection of the victim of the damage. However, this aspect of protection can be more or less direct.

Property damage insurance aims at preservig assets regardless liability of the insured or of any other parties.

Furthermore, aside from actual insurance products, there exist systems of "construction bonds", which are types of financial guarantees aiming to guarantee projects and construction contracts performance.

We assume that by "insurance regimes", we should consider not only actual insurance types (property damage and liability insurances) but also "construction contract bonds".

We suggest a global and extensive approach to the concept of "national insurance schemes" which, implies all of the mechanisms and solutions which contribute to cover the risk and to help to make solvent commitments of those involved in the construction process. And this is so whether they are legal, contractual or simply down to customs. Failing this, there is a risk of misunderstanding the approach adopted by this or that part of Europe.

Moreover, an approach to the insurance regimes cannot be made without understanding the constraints and mechanisms of reinsurance, and considering models which can facilitate the development of reinsurance.

Insurance scheme is an organisation model or structure, being a voluntary response provided by the market to a need of guarantee or security. Insurance scheme should not be confused with an "insurance regime", which is a larger concept, frequently linked to national regulatory framework and in some countries may find its origins in legal texts. We could identify the same needs of security and guarantee existing in different EU Member States and we believe that different insurance schemes, taking account of local particularities, may be created in order to achieve the same goals or respond to the same needs.

2.2. The construction sector

According to Eurostat[29] it is estimated that in 2007 there were around 3.1 million construction enterprises across the EU-27, which generated an estimated EUR 1 665 billion of turnover. The EU-27 construction activities provided employment to an estimated 14.8 million persons and generated an estimated EUR 562 billion of value added.

Eurostat data indicate that a majority of construction entreprises operate on a local market. The sector is composed by a large number of small firms and relatively few large ones. Small and craft firms employing less than 50 persons jointly employed 72.1% of the EU-27 construction workforce in 2006. Such entreprises generated in 2006 around two thirds of sectoral value added.

The above statistical data refer to the following activities: site preparation, general construction, building installation and completion and renting of construction or demolition equipment. But the scope of construction goes beyond new buildings, renovation and on-site civil engineering. It also involves material suppliers, manufacturers of building components and equipment, facility and property managers and urban planners. FIEC (European Construction Industry Federation, 2006, www.fiec.eu) estimates that 26 million workers in the EU-27 depend, directly or indirectly, on the construction sector.

The present study does not focus solely on the construction sites activities but also encompasses activities along the construction supply chain (i.e. architects, designers, contractors, suppliers, clients, service providers). The issue of sustainable construction for craftsmen and small firms which represent the highest share of employment will be looked at in detail. This will lead us to study solutions which should improve the relationships between contractors and suppliers and reduce the fragmentation of the supply chain.

2.3. Diversity of national insurance systems

The first observation which imposes itself with respect to the general framework of construction regimes in Europe, is the existence of an extreme diversity of liability and insurance regimes across the 27 EU Member States. The following chapter provides an outlook of the existing diversity at the European level and it also highlights some points of convergence, which have been identified by the ELIOS research.

[29] EUROSTAT, *The EU-27 construction sector: from boom to gloom,* Statistics in focus, 7/2010

Diversity of national liability and insurance regimes

Previous European and international studies listed above carried out in the field of construction liability and insurance have tried to identify some trends, which vary between the Member States.

The early studies of C. Mathurin[30] and GAIPEC group[31] have already underlined a great diversity of existing regimes in twelve EU Member States at the time. Rejection of the idea of legislative harmonisaion in this matter and the progressive enlargement of the European Union has led to a patchwork of 27 different national regimes. Thus some countries define liability of the constructors' through legal rules, sometimes compulsory but not systhematically, others privilege standard contractual forms.

The scope of this liability (strict or based on fault) and its duration (from 1 to 20 years following completion) also vary from one country to another, even though the duration of 10 years is frequently chosen, at least as far as structural construction defects are concerned. With regards to insurances and other securities, they are mandatory by law in some cases, in some countries they are systhematically taken out in spite of absence of any legal obligation and sometimes they are purely optional (see chapter 6).

The patterns shown in the previous analysis can be resumed in the following way:

- In countries influenced by Roman law (France, Spain and Italy), insurance obligations have been imposed by legislation (with respect to housing only in Spain);
- The Anglo-Saxon model (the United Kingdom and Ireland) sets itself aside with the existence of contractual guarantees which are largely independent of rules of liability based in fault (for example National House-Building Council);
- In Northern Europe (in the three Nordic countries, Denmark, Finland and Sweden, and also in the Netherlands), the basics of obligations and responsibilities are largely governed by contracts drawn up by professionals;
- In Germanic countries (Germany and Austria), the approach is different. It can be seen that the act of building is largely governed by normative constraints and that "bond" style guarantees are used;
- Regimes in new member countries from Central and Eastern Europe are generally based on the liability framework defined by legislation. The approaches adopted in terms of mandatory insurance vary from country to country, starting from a generalised mandatory insurance model in Bulgaria and Slovenia, through a model where insurance is mandatory only for certain categories of market parties (Czech Republic, Lithuania, Poland).

Although the main conclusions of the previous studies are largely confirmed by ELIOS research, ELIOS has attempted to go beyond the focus on diversity and on typology of regimes, which is rather based on structural approach described in the part 1 of the report.

[30] C. Mathurin, *Étude des responsabilités des garanties et des assurances en vue d'une harmonisation au niveau communautaire*, 1989.
[31] GAIPEC, *Liability and insurance regimes in the construction sector*, 1992.
http://ec.europa.eu/enterprise/construction/info/study_liability_insur_regimes_sect_construct.pdf

To the contrary, a functional approach adopted was focused on results achieved with respect to a particular question or problem and privileged identification of goals pursued by the various legal systems as a response to a particular problem.

In fact, as it will be demonstrated later in the report, within this diverse framework some clear similarities between apparently disparate regimes can be identified if a functional approach is applied to the practice of construction defects insurance.

Three principal convergence points identified by the ELIOS team are as follows:

- A clear tendency to choose the period of 10 years for duration of insurance cover (compulsory or not) of most serious construction defects, even if such a duration does not necessarily correspond to legal or contractual liability limitation periods applicable to constructors (for example UK and the Netherlands),
- The scope of application of existing insurance obligations is generally focused on dwelling sector (or on some particular forms of dwellings in the case of Finland). Such a scope is slightly larger in Italy, where it applies to real estate purchases by "consumers",
- Risks covered by construction defects insurance are in particular those affecting stability or structural resistance of the construction works although the most recent developments tend to go beyond this scope. Concept of *fitness for purpose* or *habitability* is applied in many national regimes.

Furthermore, it is worth to note that some Member States are in the course of reflexion on a possibility of introducing insurances of post-completion construction defects with duration of 10 years. Such reforms have recently been discussed in Belgium, Czech Republic, Greece, Luxembourg and Portugal.

It can also be concluded that a large majority of the most economically developed EU Member States either already has or intends to introduce widespread latent defects insurance schemes.

<u>Analysis of liability and insurance regimes in each country</u>

Based on the findings from analysis of the national liability insurance regimes, the research team has undertaken to draw a summary table indicating main characteristics of liability and insurance regimes in Europe.

Such a summary table is provided in the part 6 of the report, in view to help in understanding how the liability and insurance regimes are structured in each Member State. The main points highlighted in the summary table are as follows:

- Specific constructor's liability framework,
- Role of contract in formation of liabilities,
- Existence of joint and several liability,
- Duration of main liabilities,

- Existence of mandatory or widespread latent defects insurance schemes,
- Existence of securities against contractor's insolvency before completion,
- Other mandatory and widespread construction insurances,

2.4. Innovation in construction

Defining innovation helps raising some of the issues facing the insurance market dealing with the construction industry.

2.4.1. Product, process, organisational and marketing innovations

For many years studies undertaken to examine innovation focused on technological innovation and particularly product innovation and process innovation. Service, marketing and organisational innovations were often neglected. The third edition of the Oslo Manual (OECD, 2005) identified this lack and addresses the question of non technological innovation. According to the Oslo Manual which becomes the reference for analysis dealing with innovation, "*An innovation is the implementation of a new or significantly improved (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations.* (…)

The minimum requirement for an innovation is that the product, process, marketing method or organisational method must be new (or significantly improved) to the firm. This includes products, processes and methods that firms are the first to develop and those that have been adopted from other firms or organisations" (OECD, 2005, p.46).

For the purpose of the study, novelty concerning the firm will not be analysed. The study will only focus on innovations new either to the market or to the world: "*Innovations are new to the market when the firm is the first to introduce the innovation on its market. The market is simply defined as the firm and its competitors and it can include a geographic region or product line*" (p.58).

The OSLO manual also details the main types of innovation:

"*A product innovation is the introduction of a good or service that is new or significantly improved with respect to its characteristics or intended uses. This includes significant improvements in technical specifications, components and materials, incorporated software, user friendliness or other functional characteristics*" (p. 48).

"*A process innovation is the implementation of a new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software*" (p.49).

"*A marketing innovation is the implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing*" (p.49).

"*An organisational innovation is the implementation of a new organisational method in the firm's business practices, workplace organisation or external relations*" (p.51).

As indicated by the fourth Community Innovation Survey (CIS4) which was launched in France in 2005 (SESSI, 2006) organisation innovations are dominant in construction (figure 4). Indeed contractors tend to innovate by

focusing their resources on the effective management of the building site. Most innovations aim at circumventing bottlenecks which, once corrected, enable improvements in productivity and safety of the building site.

Figure 4 - Distribution of innovations according to firm size (in % of innovator and non-innovator construction firms)

Type of innovation / *Size*	Product, process, organisation, marketing	Process	Organisation	Marketing
10-49	38.0	14.7	32.8	10.1
50-249	51.6	26.7	43.5	10.8
250 and more	70.1	55.3	58.7	21.2
Total	39.4	16.1	33.9	10.2
Manufacturing industry	53.7	36.1	35.4	15.0
All market activities (Construction, manufacturing and services)	46.2	24.9	33.7	17.7

Source: SESSI (2006)

As indicated by the OECD, overlapping between products, process, marketing and organisational innovations may exist. It is mostly at the interface between process and organisational innovations that mentions of this sort appear.

Liability and insurance regimes are concerned by all kind of innovations. A short look at the damages concerning French buildings with less than ten years old indicates that most troubles are due to unsuitable design, inappropriate implementation, lack of maintenance, and incidents on the building site (AQC, 2009). Problems with products still represent a small share of the total number of damages. However these basic figures can be misleading. Difficulties encountered during the implementation of a new product may lead to damages. This case will be classified with "default of implementation" but the primary source may rather be the product and the lack of communication between the actors of the building site. Then a more detailed analysis may reveal that a deficiency in training or the lack of interaction between manufacturers and contractors may explain the damages.

This example shows that the classification between sources of damages is never straightforward. Similarly there are interactions between types of innovation. For example product innovation can modify the organisation of the building site and contribute to the development of a new organisational configuration.

2.4.2. Environmental innovations

Environmental innovations are covered by the OECD definition. But Renmings (2000) considers that this definition suffers from weaknesses. It does not distinguish environmental and non-environmental innovations. Moreover innovations developed by households or concerning institutional changes are not enclosed in the definition. "*Putting emphasis on innovation toward sustainable development is motivated by concern about direction and content of progress. Thus the additional attribute of innovations toward sustainable development is that they reduce environmental burdens at least in one item and, thus, contribute to improving the situation in the problem areas mentioned above*"[32] (idem, p.322).

[32]The main problem areas were: Greenhouse effect, depletion ozone layer, acidification, eutrophication, toxic impacts on media/ecosystems, toxic impacts on humans, loss of biodiversity, use of soil, land, and resource use.

One characteristic of environmental innovations is their complexity. "*Most often they require rearrangement of product chains or even the setting up of new chains from scratch (as in the case of biofeedstocks, or fuel cells). Because of the complexities, and hence the risks involved, most industries shy away from technological environmental innovations in the first instance. That is why they need a reliable legal context which minimises economic risks, enables effective planning, and ensures fair competition. In addition, both companies and governments have usually needed a certain amount of pressure from environmental movements and public opinion to get kick-started*" (Huber, 2008, p.362).

It appears from these lines that regulation and insurance schemes can contribute to the diffusion of environmental innovations in the construction industry if it creates a framework which entails trust between the actors in the supply chain.

2.4.3. Incremental, radical and architectural innovations

Innovation can also be classified according to its impact which is linked to the degree of novelty. Incremental innovation introduces minor changes to existing goods and services. They tend to reinforce the competitive advantage of established firms. Defaults of implementation are also less risky. Conversely radical innovation "*has a significant impact on a market and on the economic activity of firms in that market*" (OECD, p.58, 2005). Radical innovation has more pervasive effects. They generate new behaviours and resistances to changes. They are also more risky.

The difference between incremental and radical innovation is sometimes just a matter of perspective. Certain innovations considered as incremental from a technological point of view can strongly modify the structure of the market. Lundvall (1992) considers that the introduction of vehicles with rubber wheels inflated into agriculture did not represent a radical technical change but that has a considerable impact on the productivity of this sector.

Similarly in construction most innovations at the project level are incremental but they can have a large impact on the sector performance. This is the case of day-to-day problem solving on site which cumulated impact is important (Sexton et al., 2007).

The aforementioned distinctions between radical and incremental innovations do not cover the whole spectrum of innovation. Henderson and Clark (1990) proposed a new framework to define further types of innovation. They introduced the notion of architectural innovation: "*The use of the term architectural innovation is designed to draw attention to innovations that use many existing core design concepts in a new architecture and that therefore have a more significant impact on the relationships between components than on the technologies of the components themselves. (…) Architectural innovation presents established firms with a more subtle challenge. Much of what the firm knows is useful and needs to be applied in the new product, but some of what it knows is not only not useful but may actually handicap the firm. Recognizing what is useful and what is not, and acquiring and applying new knowledge when necessary may be quite difficult for an established firm because of the way knowledge – particularly architectural knowledge – is organized and managed*" (idem, p.13).

For example if one considers the case of photovoltaic membrane system, it comprises several components: one photovoltaic cell, one roof deck and one roof membrane layer. The membrane can be disposed between the photovoltaic cell and the roof deck. The overall architecture of the system lays out how the component works together. The aim of the system is to provide a system for producing energy but also for creating a thermal barrier, isolating the building and bringing watertightness. Each component of the system performs

distinct functions: the photovoltaic cells produce electricity and the roof membrane layer isolates the roof deck from the photovoltaic cell.

2.4.4. Barriers to innovation

"*Identifying the factors that drive innovation and those that hinder it is of great value for understanding the innovation process and for formulating innovation policy*" (OECD, 2005, p.106).

The construction sector is characterised by a complex supply chain with various players having competing and/or complementary interests. This fragmentation is usually considered as one of the main barriers to innovation. For example owners are often at the origin of a project with a specific purpose (housing, office, hospital, school, theatre…). They generally invest in the design and the construction of the asset, except in some cases (PPP for instance). The users occupy the asset and may exploit the asset although this is not always the case. Service providers are partly or fully in charge of the exploitation and maintenance of buildings and infrastructures. Owners do not always have interest to invest more funds at the design and construction stages because they may not benefit from this supplementary investment. This absence of integration between actors of the project process hinders innovation.

Factors hampering innovation activities are either internal or external. According to SESSI (figure 5) cost factors (cost too high, lack of funds within the enterprise, lack of finance from sources outside the enterprise) are the main obstacles to innovation. Knowledge factors (lack of qualified personnel, lack of information on technology, lack of information on markets, difficulty in finding cooperation partners) rank second.

A detailed analysis (SESSI, 2006) indicate that for small innovative firms the main factors hampering innovation are the lack of funds within the enterprise (33.7%), the cost of innovation (27.5%) and the lack of qualified personnel (25.5%). For firms employing more than 250 people uncertain demand for innovation and cost of innovation were the main obstacles to innovation.

Figure 5 - Barriers to innovations according to firm size (in % of innovative firms)

Type of innovation / *Size*	Cost factors	Knowledge factors	Market factors	Other reasons for not innovating	Total
10-49	46.5	31.7	30.7	14.0	70.7
50-249	31.6	30.1	25.2	10.2	54.2
250 and more	16.6	18.5	37.7	8.2	54.9
Total	43.6	31.0	30.3	13.3	68.0
All market activities	41.0	26.4	25.0	8.2	60.8

Source: SESSI (2006)

The lack of qualified personnel may become one of the strongest barriers for the development of environmental innovations. Indeed as indicated before most of these innovations "*require rearrangement of product chains or even the setting up of new chains from scratch".* This means that actors of the construction industry need to develop new skills to handle complementary tasks.

For example in the case of photovoltaic membrane system, one of the issues is to be sure that the actors in charge of incorporating a photovoltaic membrane system into the building have the competencies to do it. It is necessary for the performance of the system that the implementation of one component is done in such a way that it does not modify the performance of another component.

As indicated by Henderson and Clark (1990, p.11) "*successful product development requires two types of knowledge. First, it requires component knowledge, or knowledge about each of the core design concepts and the way in which they are implemented in a particular component. Second, it requires architectural knowledge or knowledge about the ways in which the components are integrated and linked together into a coherent whole*".

The construction industry is very sensitive to this issue because a change in one component often modifies the property of a different one. Thus it creates new risks that could have been considered as not important before the introduction of the innovation.

2.5. Sustainable construction

In this chapter, we first address some initiatives of the world construction community and give a flavour of what a sustainable may be and may not be.

2.5.1. Some initiatives of the construction community

"Sustainability's terminology can be a minefield." (Siemens - Mc Kinsey, 2008).

Most of reports refer to the frequently cited definition of sustainable development taken from (Brundtland, 1987, chapter II, point 1)):

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts:

- *the concept of 'needs', in particular the essential needs of the world's poor, to which overriding priority should be given; and*
- *the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and future needs.*

This definition encompasses several domains (generally named as the three pillars of sustainability: economics, environment, ethics) and calls for a holistic view on any human activity. Such a wide definition brings problems when practical measures have to be defined in a specific human activity domain such as construction.

Several initiatives were taken to clarify the situation and help constructions stakeholders to define frameworks for actions:

STANDARDISATION: ISO TC59 "BUILDING CONSTRUCTION"

- **SC14** ***"service life planning"*** publishes the ISO 15686 series of 10 standards covering service life prediction methodologies, reference service life assessment, life cycle costing approach, functionality and serviceability assessment.
- **SC17** ***"sustainability in building construction"*** published ISO 15392 on general principles, ISO 21930 on Environmental declaration of building products (EPD's), ISO/TS 21929-1 on indicators, and ISO/TS 21931-1 on environmental assessment of buildings. These two last documents are currently being discussed to become standards, and TR 21932 on terminology is on the way for publication.

The general principles (figure 6) are overarched by the following statement: "*Buildings contribute to a sustainable development when designed and operated to match the appropriate fitness for use, with minimum adverse environmental impacts, while encouraging improvements in economic, social and cultural aspects at local, regional and global levels"*. SC17 is now preparing an application guidance document on how to practically implement the 9 general principles in a construction project.SC17 also extended its domain to civil engineering works. Finally, since 2007, SC17 extended its domain to civil engineering works, and a document is in progress on specific sustainability indicators.

Figure 6 - The general principles of sustainability in building construction

continual improvement
Equity
global thinking and local action
holistic approach
involvement of interested parties
long term consideration
precaution and risk
Responsibility

EUROPEAN PROGRAMMES:

- Among many European projects related to sustainability in construction, **SMART-ECO** (www.smart-eco.eu) which will end in 2010, established a "vision" on what should be a sustainable building in Europe in 2030 (figure 7).

Figure 7 - The Smart-Eco vision of a sustainable building in Europe in 2030

Result from the involvement of all interested parties and be designed to meet its occupants' needs individually and collectively;
Be completely integrated into the relevant local building, town-planning or environmental–planning schemes and infrastructure;
Be designed or refurbished from a Life Cycle perspective;
Have its environmental impact minimized over the estimated or remaining service life;
Deliver economic value over time ;
Provide social and cultural value over time and for all;
Be healthy, comfortable, safe and accessible for all ;
Be designed or refurbished to be user-friendly, simple and cost effective in operation, with measurable technical and environmental performances over time;
Be designed or refurbished to be adaptable throughout its service life, with an end-of-life strategy;

CIB AGENDA 21 FOR BUILDING CONSTRUCTION:

- a specific sectorial response to the Bruntland agendas, developed through the worldwide construction community network: a conceptual framework with 3 objectives: create common language, establish a sound programme of collaborative activities, and provide a source document. http://www.cibworld.nl/

These efforts will undoubtedly drive to operational tools helping construction stakeholders on a daily basis but there is still a long way to reach such a situation. Nevertheless sustainable buildings are already built or under construction.

2.5.2. Towards sustainable buildings

A sustainable building is first of all a building. As such, it is a system that aims at fulfilling functions directly related to the programme of the construction operation, which describes the intentions and expectations of the client with respect to his budget.

The precise definition of these functions and their relative weight depends on each particular operation. The functions of an office building are different from that of a housing building.

Sustainability is not an additional function but is incorporated in these generic functions through a thorough reflection starting at the early beginning of a construction operation. This reflection aims at incorporating environmental, economic and social issues over the built environment life-time.

Whilst ensuring basic performances, sustainability brings new dimensions linked to a holistic approach of the construction in relation with its environment.

The aspects of sustainable built environment are then plural and extend traditional considerations, focussed on the construction phase, to time, space, economic, energy and environment issues.

Sustainability could be seen as a movement towards a rural construction economy characterised by an efficient use of local resources to build locally adapted buildings. The challenge for the XXIst century is to succeed in this direction with an exponential demography, a fast growing urban population looking for more comfort, a perspective of relative scarcity for some natural resources and a very likely modified but locally uncertain climate.

Sustainability will not be achieved by only implementing fashionable equipments/building parts such as photocells roofing or over-insulated walls. It needs a much deeper transformation of the construction process starting from a comprehensive expression of the future use of the building including users' behaviour and maintenance conditions.

The main issue is the following: all the actors should consider the future built works as a part of a wider system, including the future users and their needs, as well as the economic context, the close natural and social environment, and even the planet. The best way to do that is to share a single brief and a single global view.

This means major changes in the actual construction practices and processes: this is a huge challenge for the building sector.

2.6. Craft and small enterprises

Craft enterprises provide a wide range of vital products and services at local level. Many are very small firms - indeed often only the owner is involved. Micro-enterprises, of which many are craft firms, face particular challenges due to their small scale. They are nonetheless an important segment of the European economy and specific efforts to help them are essential for European growth.

Craft enterprises, for example carpenters, butchers, bakers, roofers, metal workers or information technicians, provide vital products and services for their local communities all over Europe. Moreover, they create jobs for local people. In contrast to larger firms, the heads of such enterprises are fully involved in all aspects of the business and remain in direct contact with customers. Micro-enterprises share many of the difficulties faced by firms in the craft sector, although they could be operating in any industrial sector.

Whilst over 99% of all enterprises in Europe are SMEs, 90% of SMEs are actually micro-enterprises - with fewer than 10 employees - and the average company has just five workers. However, these micro-enterprises account for 53% of all jobs in Europe, so their importance to the European economy is enormous.

Their small size and limited resources mean micro-enterprises face particular problems. Finding the finance to get a new business going, or to grow an existing one is a difficult challenge. The administrative tasks, or red tape, which all firms have to carry out weigh particularly heavily on Europe's micro-enterprises. And finding staff with the right skills, willing to work for a small firm can be a problem, as is ensuring they have the time to update their skills and keep up with developments in the field.

Whilst micro-enterprises are very often the source of innovation, they are also especially vulnerable to competition from counterparts who introduce new products or services, or improve their production processes, lacking the resources to respond rapidly.

Common characteristics of craft (-type) and micro enterprises

According to the European Commission[33]:

"*1. The category of micro, small and medium-sized enterprises (SMEs) is made up of enterprises which employ fewer than 250 people and which have an annual turnover not exceeding EUR 50 million, and/or an annual balance sheet total not exceeding EUR 43 million.*

2. Within the SME category, a small enterprise is defined as an enterprise which employs fewer than 50 people and whose annual turnover and/or annual balance sheet total does not exceed EUR 10 million.

3. Within the SME category, a microenterprise is defined as an enterprise which employs fewer than 10 people and whose annual turnover and/or annual balance sheet total does not exceed EUR 2 million."[34]

According to the FIEC (European Construction Industry Federation, 2006, www.fiec.eu), 93% of the 2.7 million construction enterprises (EU 27) employ fewer than 10 employees.

According to these definitions, our study will mainly focus on firms employing fewer than 50 employees.

[33] European Commission (2005), *The new SME definition – User guide and model declaration*, Entreprise and Industry Publications

[34] European Commission, Commission recommendation of 6 may 2003 concerning the definition of micro, small and medium-sized enterprises, 2003/361/EC, *Official Journal of the European Union* L 124/39, 20 May 2003

There is no European definition for craft enterprises. This is mainly due to the very different legal or non-legal aspects and understandings at national level of what a craft enterprise is. In lack of a European definition, there are, nevertheless, some characteristics craft enterprises have in common all over Europe and which reflect the vast majority of micro enterprises at the same time:

- strong involvement of the owner or head of the enterprise in all steps of the workflow (financial independence, strong
- personal responsibility)
- craft, technical and management competences (apprenticeship as one means of passing on those competences)
- active contribution to production of products and services (in particular tailor-made and single-size-products or in small quantities)
- proximity to the client and local activities.

European support

The Commission is working in partnership with Member States to improve the business environment in Europe, under the Lisbon Strategy for more growth and better jobs. Whilst the strategy seeks to improve conditions for all sizes and types of enterprises, the Commission recognises that specific initiatives and sustained efforts are required to enable Europe's smallest firms to realise their true potential. It is therefore undertaking work in a range of areas to help and encourage Member States identify and implement measures in support of craft and micro-enterprises, notably through the Small Business (SBA) Act for Europe and the European Charter for Small Enterprises.

More specifically, the Commission aims to:

- increase the knowledge of the sector through studies, conferences and workshops (please include hyperlinks to the proposed new sub-pages) and statistics
- identify obstacles to the sustainable development of these enterprises and to prepare proposals to address them
- enhance craft and small businesses' capacities for growth in the internal market, for instance through SME friendly European standards and better knowledge about them, through improved access to public procurement or through the promotion of innovation and research in micro- and craft businesses through cooperation, as well as
- promote a more favourable business environment for craft and small enterprises through quality support services, better legal and fiscal environment, social protection of new entrepreneurs etc.

More information available here on European conferences, best practices, pilot projects and results, and Studies and reports.

Encouraging craft and micro businesses to invest in life-long learning

Increased global competition, the transition to a knowledge-based society, and rapidly changing technology transform most aspects of the working life of a small firm and craftsmen. In the future, they will need people with different occupational skills, with specific job profiles and with more medium- and high-level

qualifications. More than ever, all Europeans need to continually update their skills and professional competences. This is why the Commission is preparing an exchange programme for apprentices to allow them to gain work experience in another European country. At current, craft and micro enterprises can benefit from mobility actions through the EU's Leonardo da Vinci programme.

Micro-enterprises in particular are affected by shortages of skilled labour, caused mainly by demographic developments, and need to overcome their difficulties in attracting the most skilled workers via a life long learning process within the company. It is essential for them to invest in e-skills, extend the recruitment processes to new groups of the population, develop workability concepts, and foster the mobility of their workforce. The Commission strongly supports initiatives to identify future skill needs and make education and training more available to employers and employees alike throughout their whole professional lifetime.

In 2009 the Commission has launched a study to identify the future skills needs for micro and craft (-type) enterprises to meet new challenges, in particular the demographic trends, the effects of global competition and the needs to adapt to new ways of working.

3. The assessment of quality

Each building is a complex system designed to ensure generic functions that depend on the use of the building. The art and skills of designers and builders are to find for each project an economical equilibrium that meets the objectives of the client.

The quality of the building reflects the adequacy of delivered building performances as regard to expected performances by the client. The actual performances result from a complex combination of actions mixing the “quality” of design, the “quality” of products, the “quality” of actors, the “quality” of implementation, the “quality” of maintenance.

The general organisation of construction project is universal and includes a limited number of main phases such as brief, design, site/factory construction and exploitation. Within such a shared global process, many detailed solutions have been imagined to ensure the final expected qualities of the building. Control is the rule but there are many ways to distribute control actions from upstream to downstream phases of the construction process.

This diversity of situation is confirmed by the observation of construction process details in different countries, for instance in Europe. Whatever the distribution of controls is, there is a need for stakeholders to get signals in order to trust information given by others involved in the construction process. Such signals may for instance concern technical performances of construction products or equipments and actors’ skills.

This chapter presents elements concerning the building quality issue in Europe through a brief overview of building control and certification regimes. A more thorough development concerns the presentation of different context for technical assessment.

Qualification regimes is another important aspect of building quality as the “quality” of actors is essential in the final characteristics of buildings. As the detail analysis of qualifications systems and procedures in the Member States is out of the scope of the study, we did not carry out a thorough study of this issue. But,

without any doubt, insurance may take into consideration qualifications of the insured in the of projects risk assessment process and premium determination.

3.1. Building control regimes

The report of a study performed in 2006 by the ECBC (European Consortium of Building Control) entitled "Building Control Systems in Europe", based on a survey in 21 EU Member States, provides the following conclusions:

"Planning and Zoning
The control whether a building project is in accordance with local development plans, especially with regard to the height of the building, to distances to the plot boundaries and to other buildings, and to the use of thebuilding, is partly performed by the building authorities, partly by special planning departments (which are, however, often also part of the local governments). This control activity is normally performed by authorities, not by independent private persons or private building control organisations and the conclusion here is that economic, political and social decisions remain the responsibility of the local or regional authorities".

"Control of Technical Requirements
In the approval of the general plans and issuing of building permits, the building authorities are still involved with three exceptions: In Ireland this is the duty of another authority, in the UK this may be done by private building control institutions, and in France only private controllers intervene (and only for public buildings this is compulsory, however for other buildings it might be necessary for insurance purposes). In those countries where the building authority approves the plans and technical details, the actual checking is sometimes partly transferred to independent private experts (Austria, Croatia, Germany, Iceland, Norway and Slovenia)".

"The organisation of building control in the responding countries is less different than expected.
Private control elements can be found in nearly all the countries, at least by means of delegation of tasks to independent private experts. Proper private building control systems are established only in eight countries (Belgium, Denmark, Estonia, France, Iceland, Ireland, Spain and the United Kingdom) and are often related to insurance systems. One can conclude that there is a general trend of "privatisation" of building control activities, but there are two different ways how this trend manifests itself:

- *either by the means of delegation of tasks from the authorities to independent private persons, but within the proceedings led by the authority (Type A), or*
- *by the involvement of private control organisations or private "approved inspectors" (Type B).*

Private control organisations had originally been established as independent third parties in the construction process on a voluntary basis, and diversified only later into the regulatory building control schemes. Private building control has in addition always had its importance for real estate investments of large international companies. Where such private systems became strong enough by their technical skills and the financial guarantees they permit, a parallel development led to the above explained Type B, whereas in countries, where the state run building control systems were considered strong enough to ensure a proper quality of buildings, the Type A development can be observed. It can be expected, that further liberalisation within the "Type A countries" may lead to problems with the quality of buildings in the middle or long run. The need for

complementary quality control in the construction (real estate) sector could trigger the development of private control institutions also in these countries.

Moreover, private building control could also be boosted by the development of the common market for services and products in the construction sector in Europe, because only private building control can extend its activities across national borders.

An additional factor, which may influence building control in Europe, is market surveillance for CE-marked construction products to be referred to building authorities. This trend can for example be observed in Germany, but other Member States might follow".

The scope of the present study does not include a detailed research on building control in Europe, however, within an approach consisting on identifying possible measures of stronger integration of insurance within construction process, the question of building control cannot be avoided. The study performed by CEBC suggests the following key trends within the EU building control "regimes":

- increasing importance of private building control within the Member States,
- process of liberalisation in the countries where building control performed by the authorities was predominant, creating the need for complementary quality control in construction,
- better "adaptation" of private building control to the reality of common market of services, with greater flexibility and international mobility,
- a generalised trend of increase in cross-border activity in construction,

3.2. Certification regimes

The situation in Europe in terms of certification and standardization of construction products has been resumed by the Commission's services in the document "Accelerating the Development of the Sustainable Construction Market in Europe". The document highlights the following points:

- need to rationalize different levels and classes of performances existing in the construction practices of the Member States and need for more coherence between the EU harmonized specifications and the language of national regulations.
- numerous labeling systems of construction materials in the Member States and need for European standards with current works on sustainability of construction works and on the assessment of the release of dangerous substances from construction products (CEN TC 350 and CEN TC 351) being considered as a possible first step towards European sustainable building passport,
- existing opportunities to expand the scope of Eurocodes in order to integrate further important aspects of construction design, possibly including energy and environmental engineering. It is considered that this process might in the longer term create a more open market for unconventional construction products and techniques with improved environmental performances and to contribute in improving the competitive position of European construction on international markets,

- considerations to simplify the procedure for the certification of innovative construction and to facilitate a mutual recognition of this certification. It is acknowledged that the innovative products and services are unlikely to fit the scope of harmonized standards and that they will require an independent assessment. Therefore a coherent approach towards assessments process would be needed in order to ensure a "common understanding of assessment procedures" and a required level of reliability. It is intended that in the framework of revision of the Construction Product Directive, the ways to improve the procedures to obtain the CE mark for innovative construction products and to reduce the cost of certification for small manufacturers will be examined.

In addition to this general framework, it is important to recall the aim of certification and to acknowledge the differences that may exist in the meaning of this concept in various contexts.

Certification is associated to an objective chosen by concerned actors among a wide range of possibilities. These choices are made by ad'hoc commissions where all necessary points of views are represented. The scope and limits of the certification are published so as to be available for any interested party. Table below gives some of such examples together with the expected outputs of the certification process.

Figure 8 - Examples of objectives and outputs of certification process

Objective	Output
Check the conformity of a construction product to (standardised/ad'hoc) specifications	Certification that the product fulfils (or not) the (standardised/ad'hoc) specifications
Assess the performances of a building as regards to references	Certification that the building meets (or not) the requirements
Check a construction or manufacturing process as regards to (standardised) requirements	Certification that the process meets (or not) the requirements
Assess the professional skills of construction actors	Certification that the concerned actor has the required skills

The certificate, which is generally the concrete output of the certification process, gives a signal to the environment of the product/process/actor/ … that the considered item has associate characteristics that are trustable.

Certification may be compulsory by law: this is generally the case for safety products/equipments/ …

Certification may be voluntary: this is often the case to give a distinctive commercial sign to clients.

Certification is widespread in construction in European countries and is strongly linked to national insurance schemes. Insurers need trustable information to appreciate the risk.

The organisation of certification also varies according to countries. Technical conformity tests can be performed in a great number of laboratories but certification mechanisms often take place in a controlled

context in order to be sure certification bodies have and maintain the capacities and skills to deliver trustable information.

3.3. Different contexts around Europe for technical assessment

In this chapter, we define the functions fulfilled by technical assessment and acknowledge the great variety of situations across Europe[35].

3.3.1. Role and limits of technical assessment

DEFINITION

In this document, the wording « technical assessment » is generally used in its wider meaning. Therefore activities such as testing, approvals (or appraisals) or certifications of construction material, product or system are considered. Sometimes, "technical assessment" is used in a restricted meaning just considering national approval: for instance Avis Technique in France, Allgemeine bauaufsichtliche Zulassungen in Germany, ATG in Belgium, …

MOTIVATIONS/OBJECTIVES

Technical assessment considers the fitness for purpose of materials, products services or processes and addresses the safety, health, durability and other matters relating to the quality of the construction in which these materials, products, services or processes are to be used.

The aim of technical assessment is to bring objective technical information to construction stakeholders, including owners, specifiers or designers, contractors and also insurers. It allows them, being well-informed, to make choices within the frame of their responsibilities.

[35] Some definitions (may be interpreted in a particular way in a specific country):

Construction system: includes all the necessary means to transform construction products into construction work (or part of), i.e. products, design rules, execution rules, equipments, competences/skills and liabilities, controls …

Technical assessment: considers activities such as testing, approvals (or appraisals) or certification … Should also normally include the generation and determination of the assessment methodologies.

Testing: submits a product to a series of tests and ends in a test report. Could also deliver some interpretation or classification on the basis of the test results.

Appraisal: expresses the opinion of an expert or a group of experts on a construction product or process or system based on his or their knowledge on the construction rules and skills.

Approval: states the fitness for intended use and the related conditions for. Can sometimes be interpreted as giving permission for a product or process to be marketed or used for stated purposes under stated conditions.

Certification: statement made by a third party on the presumption of the conformity of a product to stated requirements. Based on one or more of the following, which could couple with production surveillance or assessment and surveillance of the supplier's quality system or both (EN 45011 – May 1998):

- type testing or examination;
- testing or inspection of samples taken from the market or from supplier's stock or from a combination of both;
- testing or inspection of every product or of a particular product, whether new or already in use;
- batch testing or inspection;
- design appraisal.

Technical assessment assists the understanding and recognition of innovative construction systems or of under continuous improving development systems. They may be pre-assessment based on partial existing data or experience, assessment of first use(s) for the erection of a construction or a limited number of constructions, general appraisal on the conditions for the fitness for use of a system[36]

VOLUNTARY/MANDATORY

Technical assessment is generally voluntary, which means that stakeholders are free to rely or not on the technical assessment results in order to advise on their choices.

In some particular cases, when the safety stakes are very important and are related to the mastery of the definition/quality of the concerned technique (product, process, system), technical assessment is then required by regulation.

LIMITS OF THE TOOL AND GENERATION OF BARRIERS

Technical assessment is generally carried out in a defined context and on the basis of a specific knowledge: given state of the art, in order to state pertinent recommendations for the attention of specific stakeholders. This freedom in self-determination of the stakeholders who benefit from flexibility on the solution answering the need for the construction of particular works, can lead to the definition of specific requirements which are seen by others as a generation of barriers to trades or to competition.

3.3.2. Illustration of the variety of situations in Europe

CSTB is a member of several networks at European or international level. Within those networks, it has contacts with other bodies who undertake similar roles but who often have different or sometimes very different structures or activities depending on their national context.

Considering the role which consists in issuing objective technical assessments often related to public safety protection but also to quality of construction, we hereafter give some examples of close colleagues acting in different contexts and having different ways of structuring.

The specificity of bodies such as CSTB is that they generate and determine technical assessment methodologies for innovative construction systems. Those methodologies are the basis for other technical assessment activities: testing methods, assessment criteria, classification criteria.

In technical assessment activities, such bodies are confronted to direct competition from other bodies with pure commercial aim, issuing technical assessments on the basis of methodologies they haven't developed: laboratories performing tests using standardised methods, approval bodies applying assessment guides developed by others, certification bodies parodying rules, just bringing indeed a more communicative stamp.

[36] Several procedures can be offered by technical assessment bodies. They are adapted to many construction project contexts (repetitive, one of a kind, urgency …) as well as to national contexts (insurance scheme, relations between stakeholders, national innovation policies ...). For example:

- In France, CSTB offers: testing and/or certification (in reference to norms or specific references for innovative products/systems), Pass'Innovation (recently developed to answer the fast growing demand on greening-related innovations), Appréciation Technique d'Expérimentation (for either a specific project or a limited number of projects), Avis Technique et Document Technique d'Application (providing information for the specific use of a product benefiting from CE marking)…
- In the United Kingdom, BBA offers: testing, certification, Prototype Assessment, Assessment Report, Agrément Certificate, HAPAS Certificate…

For each of the examples taken from six European countries, we briefly present the main feature of the organisation through a short analysis of the role of key national players. The selected examples are chosen for illustration purpose and do not pretend to be exhaustive.

FRANCE

The Centre Scientifique et Technique du Bâtiment (CSTB, www.cstb.fr) is a public organisation with an industrial and commercial character, whose main aim is "*to perform scientific and technical studies and research studies concerning construction and housing* ".

It conducts research studies, testing, consultancy activities, technical assessment and certification. Research studies are supported by public order but also by private order and self-financing.

Looking back to CSTB development, one may consider that research allows or generates the creation of laboratories and that its results and its means can lead to the development of consultancy and technical assessment. All this permits the establishment of requirements for certification. Performing the Avis Technique and certification (with related tests) is feeding-back the whole scheme.

In France, several industrial technical centres have particular skills in specific families of materials: concrete, wood, metal… They own research and testing means and are generally active in the certification of products manufactured from those materials.

In France, technical assessment is mainly voluntary. It is generally the free market within which each stakeholder fulfils his responsibilities, which incites for technical assessment, thus getting an objective assessment of the normal use conditions (i.e. with current risk) and being warned of the conditions leading to an increased risk. From an economic point of view and based on its fees, the mandatory insurance is balancing a technical risky decision/solution[37].

When public safety stakes are important, the State regulates, leaning on technical assessment, where necessary, so as to demonstrate compliance with requirements.

We can notice in France that the building permit is principally an administrative act designed to check that rules for urban planning and estate taxation are satisfied but technical issues are not considered..

GERMANY

The Deutsche Institut für Bautechnik (DIBt, www.dibt.de) is a public organisation (federating the powers allocated by the regions). Its main aims are to agree on non-standardised construction products, to take part in the standardisation of construction products, to draft the Bauregellisten ('Construction Products Lists') for construction products containing those technical specifications which are to be respected on a legal level, and to prepare technical decisions, e.g. on provisions for design and execution of buildings.

[37] Insurance, based on technical assessments, supervisors' reports and accidents/disasters analysis, is informed of reliable techniques and the ones that give rise to specific risks. Based on this, it is responsible for specifying the insurance premium to be applied to insure construction works. A specific risky approach/solution normally leads to a higher premium, thus inducing stakeholders to be careful. So, insurance acts as an economic risk regulator.

It approves innovative products, prepares legal notifications, establishes experts' appraisals, recognises testing laboratories, inspection bodies, and certification bodies, and coordinates market surveillance programmes.

To maintain its technical competence and determine assessment methodologies, it shall gather and coordinate external knowledge (expertise network): academic researchers, laboratories (university or private), professional unions …

Whenever DIBt is involved in the management of research, the latter is principally carried out by universities. Some academic researchers work both in a university laboratory and in their own private laboratory.

Certification is performed by laboratories, experts or certification bodies that are recognised for their tasks.

In Germany, technical approval of non-standardised products or systems is to a great extent required by regulation (mandatory): the official lists mentioned above state the families of products or systems for which it is sufficient to comply with standards or other technical specifications. If the product is deviating from such a technical specification, generally an approval by DIBt is legally required. There is also an approval necessary in case the product is not covered thereof and is of importance with respect to the fulfilment of the requirements of the Building Codes by the works. This aspect is also decisive for defining the procedural elements for the verification of the compliance with the technical specification of the lists or the approval, resp. In most cases, a certification or a manufacturer's declaration on the basis of an Initial Type Test done by a notified body is required.

We can notice that in Germany the building permit covers the technical supervision of construction work projects.

BELGIUM

Several inter-acting organisations are in charge of technical assessment.

The Union belge pour l'Agrément technique de la construction (UBAtc, www.ubatc.be) is an organisation under the control of the ministry and the regions; its aim is to issue approvals, both at national (ATG) and at European level (ETA). It relies on the technical expertise of a number of organisations that are able to perform independent and impartial assessments of construction products and systems and on the contributions of industry federations verifying whether the assessments take into account day-to-day experiences on building sites. Approvals are developed in Executive Bureaus comprising independent experts and endorsed in "Specialized Groups" comprising industry representatives and the members of the Executive Bureau.

UBAtc is set to be re-organized. This reorganization will remove the decision taking role the authorities used to have.

Although a number of other specialized organisations provide very valuable contributions at a sectoral level, the UBAtc benefits most from the contributions from three organisations: the BBRI, SECO and BCCA.

The Belgian Building Research Institute (BBRI / CSTC / WTCB, www.bbri.be) is a private professional organisation financed through the "De Groote" law by building construction contractors; it aims at research, dissemination of knowledge, consultancy activities and contribution to innovation and development of construction. It has laboratories.

The Bureau de Contrôle Technique pour la Construction (SECO, www.seco.be) is an organisation that aims at supervising construction work projects but also performs construction products and management system inspections.

SECO and BBRI have developed the Belgian Construction Certification Association (BCCA, www.bcca.be) which is involved in certification within the construction sector (management systems, construction products and systems, personnel (competences), construction processes).

Despite those "independent" organisations with different liabilities, there is some common share ("share" in the sense of non-redundancy) of the technical expertise. Thus, one can meet a Belgian expert representing one or another role.

In Belgium, the approval and the certification used to be linked. In rare cases, approvals were made obligatory through references in legislation, but Belgian approvals have always been intended to be a voluntary initiative of the industry. The close involvement of the authorities in the decision taking process may have given the perception that approvals were obligatory.

Following an action undertaken by the European Commission[38], approval or certification now has a voluntary character left to the self-decision of economic stakeholders depending on their need for work quality. The approval (ATG) systematically requires certification of products or systems.

UNITED KINGDOM AND NETHERLANDS

In these two countries, technical assessment bodies (approval, certification, tests …) are independent economic players who have private organisation and functioning rules. Depending on the technical domain, they may act as competitors.

The division is quite similar to the French situation where several technical centres may act; but the private character of those organisations changes their attitude and there is no technical public "coordinating" organisation like CSTB or SETRA. Then, a large number of those sometimes small organisations participate in the work undertaken within EOTA in a more or less regular way and with a large cost impact.

The British Board of Agrément (BBA, www.bbacerts.co.uk) is an independent organisation whose aim is to issue "agréments" which systematically include certification of factory production (the final result is a document which is quite similar to the assessment part of the French Avis Technique and is named "BBA Agrément Certificate"). BBA owns a few laboratories (mainly: thermal insulation, ETICS (external thermal insulation composite systems), waterproofing) and performs a few research studies; it has to acquire the necessary knowledge from organisations, mainly including universities. It is involved in building works quality and runs several qualified installer certification schemes (for insulation, windows, ETICS (external thermal insulation composites systems) and a thermal performance of building parts certification scheme; its approach is very pragmatic (efficiency is a priority compared to scientific and technical perfection).

[38] The European Communities Court of Justice stated in its decision of 13th March 2008 in the C-227/06 affair that Belgium was creating an obstacle to the free movement of goods when requiring the BENOR certification.

BBA works with several "representatives" in the different regions in the UK, thus having the benefit of a close relationship with its potential customers as well as with stakeholders including local authorities. BBA has been selected on the basis of an open tender and is under contract (supervised by the "Community Local Government (CLG)") to act as a spokesman body for the UK within EOTA (coordination and representation).

There are several UK competitors to the BBA, for example in the insulation products area where BM TRADA organisation[39] is trying to enter/develop.

In the United Kingdom, technical assessment is voluntary. In a liberal market, each stakeholder performs its responsibilities and encourages technical assessment in order to rely on an objective assessment of normal use conditions, i.e. with usual risk.

In the Netherlands, although certification is voluntary, Dutch certification bodies have oriented their service as a means of demonstrating the conformity of a product to national regulatory requirements, where CE marking is just a passport without any guaranty of local conditions; certification is then a tool that facilitates the users' choice in a larger European offer/market.

POLAND

The Instytut Techniki Budowlanej (ITB, www.itb.pl) is a public organisation under the control of the ministry of construction. It aims at research and technical development to ensure the quality of Polish building industry and to protect the interests of construction works users. ITB undertakes research activities in relation with universities, performs tests, consultancy, technical assessment and certification. It is designated by the Polish State to issue technical approvals. It is a certification body.

A national technical approval can be issued until a harmonised European technical specification is adopted. Products covered by a technical approval shall also be systematically certified.

Certification of products is generally voluntary but in case of safety stakes, it then becomes mandatory (standardised products or products covered by an approval). As soon as a product is CE marked, on the basis of a harmonised European technical specification (hEN or ETA), the possible (safety stakes) national mandatory certification is not required anymore.

In addition, when entering the EU, Poland amended its regulation on construction: it does not state any further requirements on conditions for technical execution and reception of works. Therefore, ITB took the initiative in stating such conditions in a series of publications (directives and instructions) which have a voluntary character. About thirty documents concerning works of different nature (equivalent to the French DTUs (unified codes of practice)) are now commonly used by building owners, architects or designers and contractors when contracting.

Figure n°9 below presents the main activities of the UEAtc members (European Union of Agrément).

[39] BM TRADA is a certification body originally established to develop quality assurance schemes in the construction industry (Chain of Custody - FSC, PEFC, and Forest Product Schemes; Product Schemes - Q-Mark Construction Products, CE Marking; Personnel Schemes - Visual Strength Grading of Timber, Fire Door Installation, Window Installation); TRADA is a Timber Research and Development Association. BM TRADA Certification has clients throughout the world and has joint venture or representative offices throughout the world.

3.3.3. Examples of networks of technical assessment bodies working to mutual recognition: UEAtc and EOTA

Most of the European national technical assessment bodies (or institutes) were created in the 1950s in the post world war period when huge reconstruction works were required in Europe. The key roles of these institutes have been oriented on technological research and technical assessment of innovative construction products, methods and systems as well as for some of them knowledge dissemination: promoting safety and quality of new buildings and constructions.

The main subjects they were confronted to were structural elements (in particular prefabrication of concrete elements) and water and sanitary equipments. With a general public interest they were established under the supervision of the ministries in charge of housing or construction.

They are running public procedure(s) involving/gathering the national stakeholder representatives' expertise or experts for a consensual appraisal based on national experiences (regulations, technical rules and practices). These public procedures focussing on the same general objective have been developed at national level considering the particular legal context on liabilities or insurance.

Some of these technical assessment bodies have identified the **need for technical exchange across the borders** on evaluating the suitability for use of the innovations. Technological research programmes have been co-ordinated or performed inviting and involving young engineer researchers from other European neighbouring countries.

UEAtc – UNION EUROPEENNE POUR L'AGREMENT TECHNIQUE DANS LA CONSTRUCTION

In 1960, France (CSTB), Italy (CORI Group), Spain (IETcc), the Netherlands (RATIOBOUW Foundation), Portugal (LNEC) and Belgium (INL) launched the *UEAtc – Union Européenne pour l'Agrément Technique dans la Construction* (www.ueatc.com).

This association acting on voluntary bases has rapidly been extended to Germany and United Kingdom and later to Poland, Czech Republic, Slovakia, Hungary, Romania … and recently to Ukraine, before the EU constitution and extension, countries and their institutes were working on coming together.

In addition to research coordination and technical knowledge exchanges, UEAtc came to recognition of the technical assessments performed at some national level facilitating the export of performing products, methods or systems.

In 30 years, UEAtc has developed more than 70 Guidelines stating common understanding of assessment procedures for particular construction product families such as for example: waterproofing systems, façade systems (external insulation with rendering systems, cladding systems…), solar collectors, metal anchors for concrete …

UEAtc has also developed two procedures for the mutual recognition of technical assessment results:

- Confirmation[40]

This procedure is dedicated to the recognition of the technical assessment results obtained in the country where the manufacturer has first placed his product or method or system as a confirmation in the new market country where the manufacturer is exporting his technology.

- Euro-Agrément[41]

This procedure aims at a common co-ordinated assessment involving the institutes of the countries where the manufacturer wants to place his product or method or system: a common work programme is defined and agreed by the institute.

Considering these technical guidelines and applying those procedures, many technical assessments have been issued by the institutes on voluntary mutual recognition principles.

The technical assessment work of the institutes is focussing on the service to the construction stakeholders: how to do the best choice and use of a product or method or system for safety and quality of construction. It concentrates on regulatory provisions that have to be met but also on material, product, design rules, installation rules and maintenance rules including durability consideration linked to the normal life versus investment of constructions.

The economical model run by the institutes for that approach is based on self-investment refunded on the issue of technical assessment documents at national level[42.]

EOTA - EUROPEAN ORGANISATION FOR TECHNICAL APPROVALS

The EOTA – European Organisation for Technical Approvals was created in 1994 implementing the CPD - Construction products Directive (89/106/CEE). Considering the essential requirements on construction works, CPD refers to two main technical specifications for CE marking of construction products: hEN (European harmonised standard) or ETA (European Technical Approval) for non (or not yet) standardised product. One of these technical specifications is required as a basis to attest the conformity and CE marking of a construction product by its manufacturer.

EOTA is coordinating the technical assessment methodologies proposed or followed up by its Approval Bodies members when issuing ETAs. Today, there are 45 approval bodies designated by their Member State from the 27 EU countries or EFTA and some observers from candidate countries which are members of EOTA.

Under the CPD framework and based on European Commission mandate, EOTA has developed 30 Guidelines (ETAG – European Technical Approval Guideline) for particular product families. These ETAG are the bases for the direct assessment of product and issue of ETAs. For a particular product, the ETA can be issued by an approval body in a consensus procedure with the other competent approval bodies. More than 1800 ETAs have been issued by the approval bodies based on mutual recognition principle as established in the CPD.

[40] Even if most construction products are now CE marked, UEAtc Institutes are issuing each year more than 20 assessments in confirmation of the work already performed by another Institute : waterproofing systems, roof systems, floor coverings …

[41] Euro-Agrément procedures have been applied for waterproofing systems, sandwich panels …

[42] Avis Technique in France, Agrément Certificate in UK, allgemeine bauaufsichtliche Zulassungen in Germany …

The ETA is mainly focussing on the characteristics of a product linked to the essential requirements, stating their level of performances, considering the intended use of the product, i.e. its fitness for use. But it does not consider all the technical conditions under which the works are designed and executed under the responsibilities of the concerned stakeholders and considering local conditions.

The economical model run by EOTA and the approval bodies is based on:

- partial financial support from the EC in the development of ETAG (less than 25 % approximately),
- national funding support from some member states to their national designated approval bodies,
- self-investment refunded on the issue of ETAs,

but the principle of competition is unfair in this situation: different statutes of the Approval Bodies (public or private), different supporting or financing rules, difference in contributing in the organisation (some are just running a business not investing at all in future development…)
There is no sustainable scheme where investment in research and technological knowledge is financed back on technical assessment activities allowing to further developing research of assessment criteria. Sooner or later the system may be blocked and the European public interest may finally be disserved.

Figure 9 - UEAtc Members Expertise and Technical Facilities

(Note: Data are missing from NISK (Ukraine) who recently joined the organisation)

Expertise and/or technical capability		CSTB France	BBA United Kingdom	IETcc Spain	EMI Hungary	INCERC Romania	ITB Poland	TZUS Czech Republic	VTT Finland	SBK The Netherlands	LNEC Portugal	SITAC Sweden	ITC Italy	SINTEF Norway	UBAtc Belgium	ETA-DkDenmark	DIBt Germany	IAB Ireland
1 Performance based assessment																		
a. National approval	**a**	√	√	√	√	√	√	√*	√	√*	√	√*	√	√	√	√	√	
b. European technical approvals	**b**	√	√	√	x	X	√	x*	√	√*	√	√	√	√	√	√	√	
c. Assessment reports	**c**	√	√	√	√	√	√*	√*	√	√*	√	√	√	√	√	√	√	
2 Testing to published methods		√	√	√	√	√*	√*	√*	√	√*	√	x	√	√	≠	√	x	
3 Designing new test procedures		√	√	√	√	√*	√	√	√	√*	√	√	√	√	≠	√	≠	
4 Factory inspections		√	√*	√	√	√	√*	√*	√	√*	√	√	√	√*	≠	√*	≠	
5 Quality management system certification		x	x*	x*	x	X	√*	√*	x	√*	x	x	x	x	?	√*	x	
6. Product conformity certification to,																		
a. National standards	**a**	√	√*	x*	√	√	√*	√*	√	√*	x	x	√	√	√	√	x	
b. European standards	**b**	√	√*	x*	√	√	√*	√*	√	√*	x	x	√	√	√	√*	x	
c. International standards	**c**	√	√*	x*	√	√	√*	√*	√	√*	x	x	?	√	√	√	x	
d. Other bespoke specifications	**d**	√	√	X	√	√	√*	√*	√	√*	√	x	√	√	√	√	x	
7 Approved installer/operator schemes		?	√	x*	x	X	√*	x	≠	√*	x	√	x	x	≠	≠	x	
8 Skill recognition schemes		x	x	X	x	X	√	x	x	√*	x	√*	x	x	≠	≠	√	
9 Environmental audits		?	x*	x*	x	X	≠	√	?	√*	x	x	x	√*	x	√	x	
10 Research		√	≠	√	√	√*	√	x	√	√*	√	≠	√	√	?	x	≠	

Expertise and/or technical capability		CSTB France	BBA United Kingdom	IETcc Spain	EMI Hungary	INCERC Romania	ITB Poland	TZUS Czech Republic	VTT Finland	SBK The Netherlands	LNEC Portugal	SITAC Sweden	ITC Italy	SINTEF Norway	UBAtc Belgium	ETA-DkDenmark	DIBt Germany	IAB Ireland
11 Consultancy		√	x	√	√	√*	√	x	√	√*	√	√	x	√	?	x	√	
12 Expert witness		√	√	√	√	√*	√*	√	√	√*	√	√	x	√	?	x	x	

LEGEND: Items with an asterisk (*) are those activities that are also covered by some form of national accreditation scheme

√ = Yes x = No ≠ = Yes, but selective ? = May not be operated yet UEAtcmatrix.2008

4. The European framework

Although there are no regulatory texts at present relating specifically to insurance of innovation or of sustainable development in construction sector, we could however remind a number of directives contributing to sustainable development, in particular in buildings, and, from the other hand, directives and numerous initiatives of professional organisations contributing to improvement of internal market of services, which our consortium will take into account in the framework of this study.

It seems obvious that sustainable development has been a major focus of European policies for several years, with a particular acceleration of legislative activities since the Kyoto protocol.

4.1. A European regulatory framework

4.1.1. Sustainable development

Several legislative texts have been adopted by the European Parliament and the European Council relative to health, energy conservation and environment.

Directive n° 98/83/EC relative to quality of water intended for human consumption

Having replaced one of fundamental texts of the European policy on sustainable development (directive 80/778/CEE), this directive aims in particular in protecting human health through introducing requirements relative to safety and cleanliness of drinking water in the EU (absence of micro-organisms and of parasites concentration and minimum quality values).

Based on national reports, the Commission issues every three years a report on quality of water dedicated for human consumption, except for mineral water and water for medical use.

Directive n°2002/49/EC relating to the assessment and management of environmental noise

This directive aims in defining a common approach of environmental noise exposure within the Member States through use of strategic noise maps and in preventing excessive noise exposure via noise mapping and action planning process.

Directive n°2006/32/EC on Energy End-Use Efficiency and Energy Services and Directive n°2008/98/CE on waste management

The above directives recently adopted by the European Parliament and the European Council introduce, for the first time in our opinion, concrete measures dedicated to ensure a creation of environmental efficiency provisions. We can note in particular the following:

- Better information for the citizens and businesses on measures undertaken by the Member States and promotion **of exchange of good practices** supported by the Commission;

- Use of financial instruments for the energy conservation, in particular in the building sector, such as publicly overseen financing options for energy end-use efficiency and **energy performance contracts;**

- Nomination of **independent public sector authorities** in charge of overall control and supervision of the introduced framework with the view to achieving the defined goals of energy savings;

- Putting in place systems for the qualification, certification and accreditation of suppliers of energy services;

4.1.2. Construction

Directive n°89/106 called "Construction Product Directive"

This regulatory text addresses reconciliation of legal, regulatory and administrative provisions of the Member States concerning construction products.

Having noted the existing barriers to the commercial exchange of construction products caused by the regulations in the Member States, in particular because of the national provisions concerning construction works (buildings and civil engineering), the directive contributes to harmonisation of these provisions with the view to eliminating the resulting trade barriers relative to construction products.

However, the scope of harmonisation in question is limited to six essential requirements defined by the Directive:

- mechanical resistance and stability,
- fire security,
- hygiene, health and safety and environment protection,
- safety of use,
- protection against noise,
- energy conservation and thermal insulation,

As we can observe, among the criteria above, the questions of environment and energy conservation are present. Therefore we consider it necessary to explore the question in more detail.
In the framework of this directive, the Member States have to implement all necessary measures in order to ensure that the construction products available on the common market are fit for their intended purpose. Under this condition a "CE" label can be delivered. Products to which the above label is attributed can be freely circulated between different Member States of the EU.

However, we can affirm, that although the CE label is certainly a "European passport" enabling unrestricted diffusion of products across the EU, it does not resolve the question of implementation of the products into buildings, which is an essential element of the construction process. Moreover, it can

be highlighted that at present there is no organisation or official body in charge of monitoring and analysing of the circulation of the construction products to which the CE mark has been attributed.

The European Commission has proposed to reduce further administrative requirements relative to construction products through replacing the 89/106/CE Directive by a new regulation aiming in reducing regulatory and technical barriers to free circulation of construction products in the European Economic Area (intended to enter into force in July 2011). The new proposal is supposed to establish a common technical vocabulary for construction products performance as well as to set up a declaration of performance.

The harmonised European norms are one of principal tools of harmonisation envisaged in the project of the future directive. In this context they define performance measurement units for products as well as testing and calculation methods for assessment of performance level. The future regulation relies on some fundamental requirements, two of which contribute in particular to sustainable development (no 3 “hygiene, health and environment” and no 7 “sustainable use of natural resources”, which is new). The process of standardisation in the framework of the future directive could also contribute to creating a dynamic of development in favor of sustainable industrial policy, by offering harmonised tools for its implementation, namely in the fields of energy efficiency and of sustainable development. Thus, the future directive should be considered as complementary to other existing EU initiatives aiming in encouraging sustainable development.

Directive n° 2002/91/CE on the energy performance of buildings

As we have indicated in the point (i) above, there is a European political will to accelerate the process of reduction in energy consumption, to address the climate change (obligations relative to the Kyoto protocol) and to secure European energy supplies (Green Paper on the security of energy supply aiming in reducing the energy dependency of Europe in the longer term).

This general goal of energy conservation is particularly accentuated in the framework of services linked to buildings, which represent more than one third of European energy consumption.

The initial text of the directive from 2002 addressed the following points:

- common methodology of measurement of building energy performance,
- minimum norms relative to building energy performance to be respected in the framework of new building construction or of major refurbishment works,
- introducing energy performance certification system,
- requirement of regular inspections of boilers (of an effective rated output of 20 kW to 100 Kw) and of air conditioning systems (of an effective rated output of more than 12 kW) as well as heating installations with boilers which are older than 15 year.

Face to the considerations above it was decided to revise the initial text of directive. The main measures introduced by the revision were:

- "zero-carbon" building objective deadline fixed on 2018,
- "zero-carbon" building definition to be precised and national intermediary goals of energy performance to be announced,
- national plans to be adapted in order to encourage energy performance improvement (such as reduction of VAT on goods and services relative to energy performance), regional development fund to be increased and European energy performance fund to be created,
- minimum compulsory standards of energy performance to be introduced for buildings being subject to a "major refurbishment" i.e. when refurbishment works cover more than 25% of the building's surface or when the refurbishment cost is more than 20% of building's value. Common methodology of building energy performance measurement to be defined before 31 March 2010 by the Commission and minimum energy performance norms to be defined by the Member States.

4.1.3. Internal market

Directive n° 85/374/CEE from 25 July 1985 called "Product Liability Directive"

This directive has led to the harmonisation of legislations between the Member States in terms of product liability and has contributed to ensure a high level of consumer protection against bodily injury or property damage resulting from defective products. The directive is applicable to industrial goods whether they are integrated or not into another product or real estate property.

The directive sets a principle of strict liability i.e. liability regardless manufacturer's fault in case of damage resulting from defects in his products. In other terms, it is not necessary for the victim of such damage to prove negligence or fault committed by the producer or importer of a product. If several parties are liable for the same damage, a joint and several liability is applied.

This text has contributed to standardise, with exception of transposition options left to the Member States, the question of defective products liability, without however addressing aspects of insurance. Moreover, similarly to the Construction Product Directive, the text does not refer to the question of implementation of the construction products into buildings.

Directive n° 2006/123/CE called "Services Directive"

In order to create an actual internal market, the Services Directive aims to facilitate free establishment of services providers in other Member States and unrestricted services provision between the Member States. The purpose of this directive consists in enlarging the choice of services offered to the recipients and in improvement of the quality of the services provided to private consumers and to business users.

It can be noted that this directive proposes development of an administrative cooperation between the Member States.

Although the directive addresses the question of insurance and of professional liability guarantees and indicates that some barriers of free services provisions may exist, it does not resolve completely the questions related to the present study in terms of innovation in construction sector. However it contributes to the debate on this issue and deserves our attention.

In fact, the directive allows that basically a Member State may require under some conditions that providers of services subscribe professional liability insurance. However, some consequences may arise in practical implementation of the above requirement if this requirement is perceived as a barrier to free provision of cross-border services.

Project of Solvency II Directive

The Solvency framework defining regulatory requirements for insurance companies operating in the European Union was introduced in 1970 and was revised for the first time in 2002 via a number of Solvency I directives. Solvency II project, driven by the European Commission working with the European Parliament, aims in a reform of the current Solvency requirements, taking into consideration evolution within the insurance sector in terms of risk management practices, financial techniques, supervision norms and etc.

Formed in a similar way to Basel II standards designed for the banking sector, Solvency II requirements are composed of three main pillars: quantitative requirements (pillar 1), governance and risk management (pillar 2) and disclosure and transparency requirements (pillar 3). The three pillars are completed with a fourth aspect of supervision on insurance group level.

National professional organisations representing construction and real estate sector have grouped themselves within European federations in order to ensure that interests of their members are taken into consideration on the European level. Most of the above federations are represented in the Monitoring and Steering group of the ELIOS project.
It can be noted that the challenge of sustainability is widely acknowledged by the construction sector and that a will to actively promote sustainable development is largely present. The insurance sector is also interested in this issue, however no specific measures have been undertaken so far. Hence, it needs to be underlined that the CEA (The European Insurance and Reinsurance Federation) as well as AEHWO (The European Association of Home Warranty Organisations) representing the insurance and home warranty sector participate actively in the ELIOS project.

It can also be noted that scientific bodies involved in CE marking relative to construction have grouped themselves within EOTA organisation (European Organisation for Technical Approval). This organisation has widely benefited from the experience of UEATC (Union Européenne pour l'Agrément Technique dans la Construction) created in 1960 aiming in elaboration of “common directives” with the view to promote mutual recognition of approvals issued by the member organisations.

4.2. Difficulty of harmonisation at the European level

4.2.1. Harmonisation considered at present as difficult to be envisaged

In 1991-1993 the Commission together with GAIPEC (Groupe des Associations InterProfesionnelles Européennes de la Construction) composed of a wide panel of European stakeholders' organisations, have studied liabilities and insurance regimes in the construction sector in Europe. The main features of the systems analysed were: works acceptance procedures, liabilities, insurance and financial guarantees.

The aim of the above study was to analyse the conditions for a possible harmonisation of the liability regimes with regards to various participants to construction projects.

The GAIPEC study has provided a valuable description of different national liability and insurance regimes across the EU and it has illustrated a very large diversity of the above regimes and practices existing in Europe. However the necessary consensus on the elements of a possible directive has not been achieved and the works towards harmonisation were not pursued.

Although the idea of harmonizing liability and insurance systems across Europe may seem appealing as a possible way to simplify several issues linked with economic activity on the cross border basis in the EU, it is necessary to recognize that at present the task of European harmonisation is considered as difficult to achieve due to its complexity and practical difficulties which might be caused by the introduction of a new, harmonized legislation on the EU level.

4.2.2. Market evolution and need to seek for alternative solutions

It is however important to notice that perception and reality of the European construction market since the study of GAIPEC have evolved. The study above has been performed in the context, where internal market of services was still a relatively new and "theoretical" concept, whereas the construction market from today is confronted with an increasing importance of practical issues related to the common market such as: mobility of labour force, scope of the market enlarged with the new Member States from Central and Eastern Europe, increased ability and interest of companies from construction sector to deliver products and services on cross-border basis thanks to less restrictions and improved technical means (transport, IT technology and etc..), and the global framework of challenges linked to the European policies of CO_2 emissions reduction calling for a rapid diffusion of new skills and innovative technologies across Europe.

Therefore, although the previous intentions of harmonisation of liability and insurance regimes have been abandoned, there is a growing interest in analysing the national systems in order to identify whether practicable alternative solutions may be created and implemented. In the opinion of the ELIOS team, a possibility of flexible solutions, addressing the similar market needs and aiming in achieving similar results across Europe in spite of diversity of national regimes should not be excluded. In the

following parts of the study we will provide examples of solutions developed in different regimes and market contexts, but which led to comparable results.

4.3. Similarity of needs in terms of consumer protection

On the other hand we could say that in EU Member States different means such as technical control, building regulations or insurance are in place in order to organize and ensure a certain level of construction quality, safety and consumer protection.

The measures employed in different Member States are diverse such as compulsory qualifications for the market parties (Bulgaria, Finland), compulsory insurance (France) or countries where technical control and insurance are available mostly on voluntary basis.

Moreover, the measures above may be required or imposed in different ways (local authorities, insurers, legal obligations, requirements of banks in the framework of mortgage procedure and etc) and provided in various combinations.

It seems however, that whatever the means employed, the needs and purposes addressed tend to remain similar in different markets.

According to the conclusion of Mr. B. Kohl[43] "each system involves certain measures of consumer protection, the disparities seem important in terms of methods of regulating this domain of activity: where some systems have chosen to define precise rules of this protection by law or by regulation, others have trusted the market in order to provide the same protection means to the consumers".

4.4. Drawbacks of the current diversity

4.4.1. Difficulties in the current situation

Cross-border activities

Criteria of analysis chosen by the European Commission in the call for tenders of the present study included also facilitating cross-border activities. It is logical to ask a question whether freedom of cross-border services provision introduced by the Internal Market Services is hampered in the case of construction sector by the existing diversity of legal regimes, building control, building regulation systems and insurance requirements across the EU. As a result of the above situation several market operators may be discouraged from exploring new markets, where they are not sure to understand and control the risks and liabilities involved.

Under the internal market and fundamental freedoms laid down by the provisions of the European Union, it is natural that cross border activites have developed considerably.

[43] B. Kohl, Droit de la construction et de la promotion immobilière en Europe, Bruylant, 2008 p.714

Previously, these activities concerned large companies or smaller firms operating in areas near the national borders. Currently the situation has changed and more and more small and craft firms try to work outside their national market.

This situation has been taken into account by certain professional organisations in their reports aiming to bring concrete answers to their members in terms of facilitating free circulation of goods and services in Europe[44].

As indicated in the reports above, one of the difficulties faced by small and craft firms involved in cross border activities is related to access to insurance.

Thus, we can refer to several incidents mainly to access the French market[45]. At the same time, it should be highlighted that it is difficult to assess the whole scope of the problem. Indeed, our different attempts have not permitted to obtain accurate and reliable information[46] on this matter. As admitted by various interlocutors contacted by the ELIOS team, there is currently no effective means of monitoring, collecting and centralising information about the impact of insurance on cross-border construction activities in Europe, therefore it is generally difficult to obtain viable data on this subject and to assess the significance of the problem at a European level as well as its potential consequences to the constructors and to their clients.

The question that arises in this context is whether we are talking about a false problem? In our opinion, the answer to this question would need to be nuanced.

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[44] See in particular:

a) European Builders Confederation, CAPEB, *Faciliter l'Accès aux Assurances des artisans et des petites entreprises du bâtiment pour encourager l'innovation et la promotion des éco-technologies dans l'Union Européenne,* 2007
b) Centre d'Études d'Assurance, *Etude européenne sur la responsabilité des architectes*, 2004, http://www.groupe-cea.com/upload/doc_doc/Document_fr/155/SYNTHESE.pdf
c) Anfor Normalisation, *Feasibility and opportunity to develop a standardization work programme concerning Engineering Consultancy Services*, 2008 http://www1.fidic.org/news/content.asp?ArticleCode=082Pr&Rubrique=Practice&Date=12/12/09&lang=en

[45] In particular:

a) "La garantie décennale en France et le droit communautaire de la LPS", 2008 by Professor Petre-Christian MÜLLER-GRAFF at the request of the State of Baden Wuerttemberg,
b) According to information provided to us by the Chamber of Commerce HWK Freiburg, around 20 complaints a month are received from German construction fimrs about difficulties to arrange the decennial liability insurance in France. The Chamber estimates that only around 1/5 of these firms are able to obtain insurance at an affordable price and the other 1/5 resign from working in France, beacuase of the difficulties with insurance. The rest of firms seem to choose to take the risk and pursue their activity without the compulsory insurance.
d) Written question to the Commission from 13 November 2009 and the following response http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+WQ+P-2009-5679+0+DOC+XML+V0//EN

[46] See:

a) The 2008 Annual Report of Bureau Central de Tarrification - a French regulatory body in charge of receiving complaints against refusal to provide a compulsory insurance by the insurance companies states that only 10 complains from foreign construction firms were registered in 2008,
b) Euro-Info Consommateurs, *Les laissés pour compte de la libre circulation des services et des marchandises dans le secteur de la construction: La situation franco-allemande,* 2008, www.euroinfo-kehl.eu

Firstly, the answer could be positive to some extent because, the difficulty seems to be marginal. As confirmed by the stakeholders approached by the ELIOS team, there is, in fact almost no information available in this field, which would be sufficiently objective or statistically reliable. Furthermore, in our view some simple measures may be likely to resolve the problem.

In the case of difficulties faced to enter the French market we are of the opinion that these difficulties have been largely resolved, especially throught simple measures such as the guide of practical information on French construction insurance for European builders published by the FFSA in 2010 and single points of contacts as defined in the art. 21 of the Services Directive.

On the other hand however, this problem should not be underestimated and should not be regarded as an exceptional situation restricted to particular Member States only. In light of fundamental trends in terms of security and guarantee in the national regimes it is possible that some new Member States would wish to implement construction consumer protection measures by means of insurance, and as demonstrated in the part 6 of the report, debates on this question have recently been undertaken in some countries. Hence, it should be considered that difficulties referred above, related to access to insurance for construction firms are likely to reappear. Each time a new insurance obligation is imposed in a national market, care must be taken that the businesses incoming from another Member State, in particular small and craft firms, have the practical means to comply, especially if their activities are focused on sustainable development.

Insolvency risk

The solvency within the construction sector is an important element from a consumer security point of view (especially taking into consideration large amounts of investment and a high degree of risk involved in the case of construction projects). It is important to underline that the construction sector is one of the most exposed to insolvency risk. On the European level, construction was among four economy sectors with the highest insolvency ratings and has contributed to 20.9% of insolvencies in 2007[47]. It is also important to notice that the construction industry is exposed to economic cycles (what can be observed on the example of the current recession) and that companies operating in the construction sector are particularly exposed to the risk of financial failure within their supply chain.

In some countries there are insurance or warranties available in order to cover the customer in case of insolvency of the construction service provider on a voluntary basis (NHBC solution in the UK) or on mandatory basis (France). However in many countries the final consumers do not dispose of sufficient ways of protecting of their interests in the case of insolvency of a construction party.

The other problem linked to the insolvency question is equitable share of risk and liability among the parties to a construction contract. In the large majority of the EU Member States, there is a system of *in solidum* or joint and several liability which means that a plaintiff may require a full compensation from any of the parties, who have contributed to the same loss. In case of insolvency of one or more parties,

[47] "Insolvencies in Europe" a survey by Creditreform Economic Research Unit
http://www.infohub.moneyadvicetrust.org/content_files/files/insolvencies_in_europe_2007_2008.pdf

the remaining ones may have to support the full charge of the loss. That is especially true when the guarantee provided by the insurer ceases in case of insolvency of the insured professional (claim's made basis).

As examples, some signals may be seen in the attached case studies, i.e. lack of guarantees against contractor's insolvency risk (Germany case study – Annexe II c), and reliance mainly on compulsory architect's professional indemnity insurance only as a security against defects (Poland case study – Annexe II d).

While this system may be considered as advantageous from the clients' point of view, in some countries it raises concerns whether the risks and liabilities, to which the construction parties may be exposed, are proportional to the services they provide and to the remuneration they obtain. As it is highlighted, in particular by the representatives of architectural and engineering professions from some countries (for example the UK or Belgium) some construction parties may be regarded as a financial guarantor for other parties to a project in case of a claim and they may bear financial responsibility for other parties failures irrespective of their own contribution to the damages.

4.4.2. Difficulties linked to sustainable development

Innovation

Successful implementation of the sustainability policies and achievement of the goals of substantial reduction of CO_2 emissions from buildings and more rational use of resources will largely depend on implementation of new, innovative products and solutions.

Innovation, as previously defined (chapter 2.1.) may concern the construction activity in different manners: product/process innovation, construction organisation innovation, service innovation. A successful implementation of both innovative products and processes on a large market scale will require:

- A capacity of the construction value-chain to deliver the innovative products and services at an affordable cost and to ensure a required level of performance,
- Acceptance of consumers and their readiness to invest in innovative technology.

This process however involves several questions related to products and processes, which have not been tested and proven on the market-mass scale. The main issues, which need to be evoked are: risk, customer perception and decision-making process relative to innovation implementation as well as practicability of implementation of the above technologies from the perspective of construction professionals.

Risk: The innovative products, as a general rule do not dispose of feedback of experience of their performance over a long term. Therefore the feedback from their use and relevant statistical data are rarely available, which makes it difficult for the parties interested to assess their performance, risk

involved and additional costs such as maintenance associated with their use. The risks linked to the installation and exploitation of the innovative products is usually not very well known and not entirely controlled.

Consumer perception: It is interesting to consider the results of a survey "Zero Carbon: what does it mean for the homeowners and housebuilders?"[48] commissioned by NHBC Foundation in 2008 among the house owners and house builders in the UK in order to collect views and opinions on implementation of the « zero carbon » policy in the UK.

The study provides the following conclusions with respect to the house owners' opinions relating to implementation of innovation:

- the main drivers of house energy efficiency considerations are cost savings and return on investment. Environmental concerns remain a secondary priority for the homeowners.
- existence of strong concerns among the house owners about additional costs, reliability of the technologies and environmental impact such as noise and pollution.

The study suggests that the most effective way of encouraging house owners to reduce energy use in their house would be to focus on the resulting cost savings. The study also highlights a considerable resistance of homeowners to meeting the increased construction costs of innovation, principally because of a lack of demonstrable payback on investment.

House builders' perception: The NHBC's study confirmed the existence of a "firm commitment among UK housebuilders to tackle issues of climate change".

However, the study highlights serious concerns about the ability of microgeneration and energy technologies to deliver the energy generation requirements of the Code for Sustainable Homes and fears that the homeowners may not accept the new technologies.

Further concerns of the house builders were that failure to maintain the new systems adequately may expose the homeowners to health and safety risks.

Taking into consideration the fact that for most innovative products their performance and inherent risk have not been proven on a large market scale, implementation of such products involves a high potential risk degree both for consumer and for construction market operators, especially for smaller entities without sufficient financial capacity to support such risk.

The role of insurance and its capacity to ensure a transfer of risk from construction market party could be an important factor encouraging the construction companies to more involvement in innovation and in increasing customers' confidence thanks to additional security.

[48] NHBC Foundation (2008) *Zero Carbon: what does it mean for the homeowners and housebuilders?* http://www.greenspec.co.uk/documents/whitepapers/NHBCsurvey.pdf

The other potential role of insurance, i.e. risk selection - should not be forgotten either. In fact, the insurance could potentially play a role of a "filter" helping to eliminate solutions introduced to the market, which do not meet sustainability criteria. In a situation, where numerous new technologies are being introduced to the market and the public awareness of these solutions is still in the course of developing itself, it is possible that without appropriate selection mechanisms certain innovations could appear on the market, which may not only be "unsustainable" but also generate risks to installers, users or environment.

However, in case of innovative products, the insurers will need to gain more control over risk, for which there is no possibility to rely on historic data in the risk assessment. The control of this risk can only be achieved through a strengthened integration of the insurers in the construction process.

Performance guarantees

By nature, the concept of a "sustainable" product implies a certain level of performance to be achieved in terms of quality, exploitation costs and of resources consumption. This means a necessity to provide performance commitments from the part of service and products providers.

This also means that the market expectations in terms of required standards of performance are likely to evolve in the longer term (and perhaps the level of liability of construction parties may evolve too).

On the other hand the guarantees and commitments provided by the construction market parties may not be sufficient to ensure an adequate security for the customers if they rely solely on the solvency of the provider.

Moreover, as we have seen on the example of the NHBC's study, a degree of resistance of the property owners towards implementation of innovative solutions comes from the fact that there is no reliable feedback of experience related to implementation and exploitation of these products and from lack of demonstrable return on investment in these products.

Therefore it is obvious that the emerging market of sustainable construction will necessarily involve performance commitments from the producers of innovative materials but also from the construction parties implementing them into a building.

In the case of integrated building concepts such as "zero-carbon homes" or "Passivhaus", the problem will become even more complex, because the overall performance of the building will depend on the efficiency of the whole "value-chain" which contributed to the project. Determining a party responsible in case of non achievement of the required performance may become particularly difficult in such cases.

Therefore the best way to provide an adequate level of security could consist of performance guarantees backed up by an insurance cover.

However it is not currently a common practice of insurers to guarantee performance. Furthermore, in order to be able to undertake such a commitment the insurers will need to strongly rely on technical

control, which is the only way to achieve an adequate assessment and control of risk in the situation of lack of historical data.

The second important aspect is duration of the guarantees proposed. It should be remembered that in the case of construction, damages caused by faulty design or workmanship may occur several years after completion of the building. It is therefore crucial that appropriate guarantees are available at the moment when damages occur.

5. Methodology of the study

5.1. Different contacts

During this study, the Elios team participated twice in the Monitoring and Steering group workshops organised by the European Commission.

The Elios team also organised a meeting of an Advisory Panel composed of members of the Monitoring and Steering group, representatives of various professional groups from the construction sector and representatives of national authorities from some Member States. In order to fulfil the commitments undertaken the ELIOS team also distributed questionnaires on liability, insurance and good practices in the Member States to a large number of market stakeholders.

In order to facilitate communication on the project a multilingual website: www.elios-ec.eu was created and progressively developed, containing among others information on the work program, on the progress of research and on important events related to the project such as meetings and workshops. The website served as an interaction platform between all parties concerned by the project.

In addition of the contractual commitments, the Elios team performed a comparative approach of cases studies, in order to analyse relationships and interactions between various participants in the construction process and the insurers from various EU Member States in the context of sustainable buildings projects.

Furthermore, the research Consortium took initiative to meet individually several members of the Monitoring and Steering group, Members of European Parliament and representatives of government authorities at the national level.

These different meetings and exchanges have allowed us to collect valuable information needed to accomplish our research. Names of the persons contacted by the ELIOS team are indicated in the Annexe III.

5.2. Questionnaires

Structure and objectives of the questionnaire

The questionnaire was composed partly as a multiple choice questionnaire with flexible answer boxes provided for many questions in order to allow the respondents to form their answer in the way which they considered as most relevant in their respective system.

The main goals of the questionnaire consisted of:

- describing the general frameworks of national liability and insurance systems across the EU as well as understanding the situation of the respective markets in terms of available insurance solutions, limits of covers and cost of insurance,
- identifying existing insurance schemes and good practices and/or possible development of such schemes, which might contribute to the promotion of sustainable development in construction.

It is important to highlight that the interest of the ELIOS team reflected in the composition of the questionnaire was focused not only in objective information concerning the framework of the liability and insurance regimes and the structure of national construction insurance market, but also in collecting "subjective" views of the respondents relative to the situation of their national markets. For this reason "subjective" questions distinguished by a colored font were introduced into the questionnaire together with flexible answer boxes.

Versions of the questionnaire

Following the propositions of modifications from the CEA (European Insurance and Reinsurance Federation), two versions of the questionnaire were created, one for the use of stakeholders from the insurance sector and another for the remaining parties.

Diffusion of questionnaire

The questionnaire was diffused to all members of the Monitoring and Steering Group and of the Advisory Panel, who were in turn invited to distribute it among the members of their organisations. The first diffusion of the questionnaire took place on 30th January 2009. The second distribution was performed on the 1st April 2009.

Also, the associated partners of the CEA/CSTB consortium specialised in legal field i.e. Beiten Burkhardt and King's College London were involved in completing the ELIOS questionnaires for the following countries: Czech Republic, Estonia, Latvia, Germany, Poland, Slovakia and the UK.

The questionnaire was made available on the ELIOS website: www.elios-ec.eu.

Results obtained

The ELIOS team has received 41 responses provided from 20 countries: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Estonia, Finland, Germany, France, Greece, Latvia, Lithuania, Luxembourg, Malta, Poland, Romania, Slovenia, Spain, Sweden and United Kingdom.

The summary table of responses obtained is provided below:

Figure 10- Contributions from different Member States

No	Country	ORGANISATION	
1	Austria	VVO	Austrian Insurance Association
2	Belgium	Bouwunie (Belgium)	The Flemish Federation of the SMEs of Construction
3	Belgium	SCRL SECO cvba	
4	Belgium		SPF Economie Service des Assurances
5	Belgium	CEA Belgium	Centre D'Etudes D'Assurances
6	Bulgaria		Bulgarian Construction Chamber
7	Cyprus		Ministry of Communications and Works
8	Czech Rep.	CCA	Czech Chamber of Architects
9	Czech Rep.		Association of Building Entrepreneurs in the Czech Republic
10	Czech Rep.		Beiten Burkhardt
11	Estonia		Marsh Kindlustusmaakler AS
12	Finland		Ministry of the Environment
13	France	FFSA	Fédération Française des Sociétés d'Assurances
14	France	FNTP	Fédération Nationale des Travaux Publics
15	France		Syntec-Ingenièrie
16	France	CAPEB	La Conféderation de l'Artisanat et des Petites Entreprises du Batiment
17	France	FFACB	Fédération Française des Artisans Coopérateurs du Bâtiment
18	France	CEA France	Centre D'Etudes D'Assurances
19	Germany	BDB	Bund Deutcher Baumeister, Architecten und Ingenieure e.V.
20	Germany	BIngK	Federal Chamber of German Engineers
21	Germany	VBI	German Association of Consulting Engineers
22	Germany		German Construction Industry Federation
23	Germany		Beiten Burkhardt
24	Greece		Hellenic Association of Insurance Companies
25	Latvia		Building and housing department of Ministry of Economics of Latvia
26	Lithuania		Balto Link
27	Lithuania		Lithuanian Builders Association
28	Luxembourg	CEA Belgium	Centre D'Etudes D'Assurances Belgium
29	Malta		Chamber of Architects and Civil Engineers
30	Netherlands	CEA Belgium	Centre D'Etudes D'Assurances Belgium
31	Poland	ITB	Building Research Institute
32	Poland	SIDIR	Stowarzyszenie Inżynierów, Doradców i Rzeczoznawców
33	Poland		Beiten Burkhardt
34	Romania		S.C. ALLIANZ TIRIAC ASIGURARI S.A.
35	Slovenia		Maribor Insurance Company Ltd.
36	Slovenia		Triglav Insurance Company
37	Spain	CNC	Confederación National de la Construcción
38	Sweden		Ministry of the Environment
39	UK	ASFP	Association for Specialist Fire Protection
40	UK	FMB	Federation of Master Builders
41	UK	NHBC	National House-Building Council

5.3. Case studies

The client is the person for whom the construction work is carried out. Clients are clearly mentioned in the EC call for tenders n°ENTR/08/007 as key construction stakeholders. For a period which depends on local context, other stakeholders (architects, consulting engineers, contractors, technical auditors, etc) are responsible to the client for the work they perform. Insurance contracts provide a cover for the liability of these stakeholders for a given project.

In order to examine the potential impacts of the use of "eco-technologies" on the relations between stakeholders (including clients) and the insurers, we proposed to carry put some case studies. This initiative was not explicit in the original proposal but was agreed on during the course of the study.

The aim of these case studies is to describe in different European contexts the relations between construction stakeholders and insurers during projects aiming at the realisation of sustainable buildings. The client is intended to be the entry point stakeholder so as to appreciate what may be changed for him from an insurance point of view when "eco-technologies" are selected and implemented.

Before presenting the cases studies, it is necessary to develop some considerations about the theoretical framework of such an analysis.

5.3.1. The theoretical framework of the analysis

A case study is an in depth study of a particular situation. It is recommended to conduct case studies when little is known about a phenomenon (Eisenhardt, 1989). Researches on innovation and insurance in the construction industry are limited. Thus the case study approach appears to be very appropriate to analyse how national schemes hamper or stimulate innovation.

Since innovations occur in a system, the notion of system of innovation is presented to understand how actors are connected together in the innovation system.

SYSTEM OF INNOVATION

The notion of a system of innovation describes the institutional framework that stimulates or hinders the innovation process. It defines the context that contributes to the development and diffusion of an innovation and helps to identify the system failures.

"*A system of innovation can be defined as encompassing all the important factors that influence the development, diffusion and use of innovations as well as the relations between these factors*" (Edquist, 2000). Four key concepts define this system:

- Organisations: firms innovate in interaction with other actors (suppliers, customers, competitors, universities, government agencies, research institutes). This interaction is shaped by existing institutional rules.

- Institutions are considered as "*sets of habits, routines, rules, norms and laws, which regulate the relation between people and shape human interactions*" (Johnson, 1992, p.26). According to this definition, institutions provide both positive and negative incentives for innovation. Their influence is positive when they reduce uncertainties linked to the innovation process and develop the stability needed for innovative actions. Conversely, they are sources of inertia when they preserve unproductive habits. This leads to 'lock-in' situations.

- Lock-in situations: when agencies develop common codes of information, they tend to be less responsive to external change. "*The enormous power of habits of thought in the economy constitutes a permanent risk for blocking potentially fertile learning processes*" (Johnson, 1992, p.29).

- Demand side instruments: important determinants of innovation include laws, regulations, standards, public technology procurement – such as a public agency which plays the role of a sophisticated customer (Edquist, 2000).

This framework shows that innovations depend upon intra-firm organisational capacities and the institutional environment surrounding the firms. The influence of institutions on organisations is quite important. This relation is also characterised by reciprocity. "Organisation can be said to be 'embedded' in an institutional environment or set of rules, which include the legal system, norms, standards, etc. But institutions are also 'embedded' in organisations. Examples are firm specific practices with regard to bookkeeping or concerning the relations between managers and employees" (Edquist, 2001, p.6).

Similarly we can assume that national liability and insurance regimes are embedded in organisations and that organisations influence national schemes.

In case of cross border provision of construction services, the knowledge used in the country that developed products innovation (goods or services) may constitute a barrier to the exportation of the innovation in a different system. Institutions (regulations, habits and tradition) in the neighbouring country may not be compatible with the innovation and prevent its diffusion.

Systems of innovation have evolutionary characteristics. It means that there is no optimal system. Consequently comparison between an optimal system of innovation and an existing one is not possible. Comparisons can only take place between systems.

In the nineties national systems of innovation were compared in order to understand why firms and/or countries differ in innovative capacity and in economic performance. Several elements were put forward to explain national differences: Network relationships, user-producer interaction (Lundvall, 1988), related and supporting industries, sophisticated buyers (Porter, 1990), education and training,

government policy and corporate R&D (Freeman, 1995) were often presented as source of competitive advantage.

NATIONAL CONSTRUCTION BUSINESS SYSTEMS

For the construction industry, Winch (2000) has stressed the importance of national construction business systems. Construction is an industry with centuries of tradition but it usually takes place in a national context. Design, site works, maintenance and operating always need to be accomplished but the relationships between the actors accomplishing these tasks will vary from country to country. Each country has its own business system. Winch distinguishes between three types of business systems:

- The Anglo-Saxon system is characterised by "a greater reliance upon liberal market values, relatively low levels of state regulations…." (idem, 90);
- The corporatist system depends more on « negotiated coordination between the 'social partners', greater willingness to intervene in the market to protect social values… » ;
- The « étatique » system has more extensive coordination of the economy by the state relatively high level of worker protection … and a desire to promote national champions in various industrial sectors ».

The comparison between British and French management processes during the construction of the tunnel linking France and the United-Kingdom shows that differences in behaviours and interpersonal relations between national teams were explained by historical and cultural factors (figure 11).

Figure 11 – Cultural and historical differences in the construction industry in the UK and in France

	Corps	Profession
Governance system	Founded at state initiative Regulated by the State Mainly employment by the State or large corporation	Founded at private initiative Self-regulated by charter from the State Mainly employment in independent practice
Knowledge base	Formal education in schools dependent upon the appropriate State ministry Bias towards theoretically acquired knowledge	Pupillage and/or formal education in general purpose universities regulated by the professional institution Bias towards empirically acquired knowledge
State/Enterprise relations	Relations between the State and the enterprise closely coordinated through the corps	Relations between the State and the enterprise clearly separated and mediated by independent professionals

Source: Winch (1998)

Similarly the requirements of the clients, regulations, customs and habits which influence the construction process vary from one country to the other. Consequently clients, architects, consulting engineers, contractors, and technical auditors do not follow the same approach from one European country to the other. Similarly the innovation path is often influenced by national regulation and insurance systems. Reciprocally the regulation and insurance regimes are shaped by organisations of each national construction industry.

The diversity of national systems of innovation can be considered as a barrier to the diffusion of innovations at a supranational level. It was also the assumption of the European Commission (2008) in its call for tender when it wrote: "the diversity of national regimes might discourage market players from entering new markets where they are unsure of their liabilities."

Another assumption of the study is that national liability and insurance regimes are 'embedded' in organisations of the national construction business system.

5.3.2. Case studies selection and method

The ELIOS team took opportunity of associated European project partners to propose potential case studies. Five case studies were carried out (table 12).

Figure 12 - Case studies identification

Country/location/type of client	Use of building/new or existing
France / Lieusaint / private	Residential building / new
Germany / Stuttgart /public	Nursing home / existing
Germany / Frankfurt /public	Primary school / new
Poland / Katowice / private	Office and laboratories building / new
Poland / Olsztynek / private	Children hospital / existing

Each case study was carried out from face to face (or phone) interview after a first contact followed by the communication of an interview framework addressing the following points (see full interview framework in annex I a):

- Description of the project
- Motivations for the project
- Who is at the origin of the project?
- Does the client or the developer need an administrative authorisation before launching the project?
- To which kind of information does the client or the developer have access before launching the project?
- What are the sources of information?
- At the end of the project what is guaranteed?
- Origin of guarantees

- Conditions associated to guarantees
- In case of claims what is the follow-up?
- Subsidiary question to insurers (through company contact)

5.3.3. Case studies analysis

Reports concerning the case studies are in the annexes. A short summary of main findings is given in this chapter.

France (Annexe I b)

The French case study concerns 31 dwellings built by a private housing company. Several innovative solutions were introduced to improve the thermal performances of the four buildings of the project:

- Prefabricated wooden structure (the curve shape of the buildings reinforces the complexity of the prefabrication phase).
- Blower-door tests were used to monitor the performances of the buildings.
- All buildings are covered by a green roof. In some cases the slope of the roof reaches 45°.
- Solar thermal systems for water heating are used for each building.

The use of prefabrication elements which was new for specialist contractors and for the architect lengthened the design stage, that was about three times longer than with traditional construction. It required a good coordination between the stakeholders of the project.

Dwellings will be occupied in May 2010. According to the French context, responsibility of perfect achievement will run for a period of one year starting from handover of the works to the client. Decennial responsibility will start from the handover of works to the client. It covers two aspects, the solidity of construction and the fitness for purpose.

The use of the above mentioned eco-technologies did not bring modifications to the general relations between stakeholders, compared to ordinary projects. The use of prefabrication increased time spent for pre-planning and design. But no extra insurance cost was recorded.

Germany (Annexe I c)

The two German case studies concern public clients and reveal the general organisation of the contractual framework through the Vergabe und Vertragsordnung für Bauleistungen (VOB: contracting rules for award of public works contracts). These rules concern the contractual relations between involved parties as well as specifications for the qualification of workers.

Within the first 4 years of the guarantee, the claims (repair, replacement, etc) due to damage are ensured according to the VOB guidelines. The consulting and engineering firms generally have to

provide financial security (5% of the contract volume, e.g. through a bank) for the 4 years guarantee period. Moreover, they are legally bound to insure themselves with insurance companies so that if any damage occurs, insurance claims can be made.

In these two particular cases the use of the eco-technologies (external insulation, sun-protections, ventilation, wood pellet boiler and photovoltaic roofing) did not bring modifications to the general relations between stakeholders, compared to ordinary projects.

No extra insurance cost was recorded.

Poland (Annexe I d)

Though they concern two different situations (new/existing, non residential/residential), the two Polish cases show similar contractual contexts based on the requirements of the Public Procurement Law and the Civil Code. The Public Procurement Law determines the requirements for deposited securities and contractor's competence. Quality guarantees, as well as engineers' professional liability are governed by the Civil Code.

For the Katovice Innovative Energy Saving Building (IESB), investors demanded that each contractor deposits a proper contract execution security (5% of each individual contract value) to cover investor's losses caused by contractors' improper execution. The amount was 10% of the contract value for Olsztynek project.

The building delivery date opens a three year guarantee periods. The investor held 30% of initially received securities, as a form of guarantee cover, which is given back to the contractor at the end of the three year period. In case, a contractor/architect refuses to repair works, then the investor can mandate an expertise. The case is then taken to court if both sides do not come to an agreement. The court mandates an ultimate expertise.

The use of the eco-technologies (geothermal heat pump, external insulation, energy saving windows, ventilation system with heat recovery, …) did not bring modifications to the general relations between stakeholders, compared to ordinary projects. The Katovice projected benefited from the knowledge and expertise of the Austrian Energy and Innovation Centre of Weiz.

5.3.4. Scope and limits of case studies

The intention of case studies was to complement other analyses of the ELIOS study by bringing a more specific point of view of clients. The selection of case studies was not as easy as expected (identification of contact persons, time for meeting and validation of minutes/reports). The selection of "similar" cases allowing a comparison between local contexts was early abandoned. The selected cases happen to cover a rather extensive range of eco-technologies that goes far beyond fashionable systems such as photovoltaic or green roofing systems.

Through this limited number of cases (five cases), no barriers were mentioned by interviewed construction team members concerning the possibility to get an insurance cover according to local contexts in the three countries (France, Germany, Poland). The access to information concerning the performances and the adequacy of selected processes/products did not look to be different than for ordinary projects even if more attention may have been paid to detail design and products/processes performances.

These conclusions, only valid for the selected cases, do not mean there are no questions for actors to get insured within the limit of their liability when innovative products or processes are implemented. This would be in direct contradiction with the motivations of the ELIOS study.

This may just mean that when circumstances are created to call for ad'hoc competences and skills, adequate design as well as organisational and technical solutions can be implemented so as to limit risks. This clearly refers to the responsibility of clients to create such circumstances.

Sustainable buildings are and will be more demanding in terms of design and control. This is the consequence of the growing importance of construction "details" that will become more important than for (pre-sustainable) ordinary buildings. The extra resources needed will not be for free.

Further case studies could allow addressing this cost issue. There is of course a balance between cost and risk. An important element to assess each situation is that decision makers get clear signals on the "quality" of all the ingredients (technical and human) needed for a construction project. This is not a new paradigm and assessment tools do exist. Their diffusion should be promoted in particular where they are not yet sufficiently developed. These tools are not static but dynamic as they can adapt to the evolution of techniques and organizations.

6. Inventory and orientations

6.1. The growing need of security and guarantees

Within the great diversity of the national regimes in Europe, it is possible to observe various manifestations of the same and general trend: a growing need for security and guarantee in the construction sector.

We will try to highlight this need and to summarise its main manifestations. Further details on this subject will be provided in the sections 6.2. and 6.3.

At this stage let us consider the situation using a functional approach. When observing the existing systems, only three principal orientations seem possible: leave the risk to the purchaser, transfer the risk by means of a more or less automatic liability upon the constructors involved or cover and potentially mutualise the risk via an insurance scheme.

From this point of view, several observations are symptomatic of the need for security and guarantee mentioned above.

Firstly, in terms of liability, in nearly all European regimes, there are some specific dispositions under which the constructors can be held responsible. Very often this means strict liabilities, whereby plaintiffs are not required to prove fault of the constructors.

As a consequence, the scope of contractual freedom for construction parties is reduced since the law imposes specific terms that apply to their contractual obligations and liabilities. In the countries where contracts play a dominant role in definition of liabilities of constructors, it is generally because the market practice in those countries has developed a system of standardized contractual forms or clauses approved by the representatives of various market stakeholders' groups or of the professions concerned.

In many Member States each of the parties involved in a construction project may be obliged to indemnify the totality of the claim, even if it is possible to determine the individual contribution of each party to the damage and to apportion liability accordingly. In this case, the party who indemnified the damage has to claim compensation from the other participants concerned in order to recover the amounts corresponding to their share of liability.

Such a mechanism is called *in solidum* liability in countries influenced by Roman law or *joint* and *several liability* in Anglo-Saxon legal systems.

Adoption of such solutions may be justified to some extent by the fact that the roles and the responsibilities of different participants to a construction operation are interlinked. But we must also take into account another reason: the risk of failure and of insolvency of one the constructors. Obviously the risk of insolvency is much more important when the period of guarantee is longer. Thus, these mechanisms enable to improve the owner's protection, but they also involve an additional burden for the party or parties *in bonis.* In other words, such measures can be seen as favourable for the consumer but as inequitable from the point of view of other project participants. For this reason several national legal frameworks have gone a step further towards implementation of widespread mandatory insurance.

Taking account of this aspect, in growing number of countries covers of hidden defects discovered after completion of the construction project have been developed. According to the details provided in the following parts of the report, it is possible to say that long term guarantees issued generally for the period of 10 years tend to become a rule at least in the most economically developed European Member States.

The 10 years duration is apparently a reasonable choice which tends to be adopted today in numerous countries. This is probably due to historical as well as logical reasons. Although the international influence of the Napoleon's 1804 Civil Code in terms of constructor's liability should not be underestimated, nowadays duration of 10 years starting from completion seems to constitute a

reasonable compromise between the necessary protection of the owner against construction defects and the constraints of the insurance market.

Moreover, we can note that some national legal frameworks or practices have also developed financial guarantees to protect the client against the risk of failure or of insolvency of the builder before completion of the project.

Furthermore, professional indemnity (PI) insurance is mandatory for architects in many countries.

Lastly, the need of guarantee may also manifest itself in another form: some legal frameworks have imposed an obligation to carry liability insurance on all participants to a construction project, although this mandatory insurance is limited to third party liability coverage.

6.2. Summary table of national liability and insurance systems

Figure 13 - Overview of national liability and insurance systems in 27 EU Member States

Countries	Liability				Insurance		
	Specific constructor's liability framework	Role of contract in formation of liability	Joint and several liability or *"in solidum"*	Duration of main liabilities	Mandatory or widespread building defects cover (post completion)	Securities against contractor's insolvency (before completion)	Other mandatory or widespread construction insurances
Austria	**Yes –** specific provisions in the Civil Code	**Medium** – minimum liability defined by legislation Important role of standard contracts (ON B 2110)	**Yes**	Civil Code: **3 years** from handover**–** statutory warranty for real estate and construciton works General limitations: **3 years** from discovery of damage and of responsible person but maximum of **30 years** from handover	**No**	**No**	
Belgium	**Yes** - Specific provisions relative to constructor's liability in the Civil Code	**Weak** – contractual liability mainly governed by legislation	**Yes** May be contractually excluded	Civil Code: **10 years** from handover – structural solidity defects (decennial liability) **10 years** from handover for other defects (vices cachées vénielles) can be modified by contract	**No** Project of mandatory construction defects insurance under debate	**Yes -** Completion guarantees for off-plan dwelling sales - compulsory under "Breyne law" 1971	PI[49] compulsory: architects
Bulgaria	**Yes** - Territorial Development Act 2001	**Weak** – contractual liability mainly governed by legislation	**Yes** Contractors and supervisors only	Ordinance N° 2 of 31.07.2003: **10 years** from handover – building construction works and equipments other durations between **5 -8 years** from handover	**No**	**No**	Third party liability insurance compulsory: architects, consultants, supervisors, contractors, developers, building surveyors
Cyprus	**No** - No specific construction provisions – common law applies	**Medium** – minimum contractual duties implied by law	**No**	Civil Wrongs Act: **2 years** from the date of occurrence or discovery of damage Parties may agree durations of liabilities under contract	**No** (except financial guarantees or bonds covering repair of latent defects - 1 to 5 years from completion -voluntary)	**No**	

[49] PI – professional indemnity insurance (professional civil liability insurance)

Countries	Liability				Insurance		
	Specific constructor's liability framework	Role of contract in formation of liability	Joint and several liability or *"in solidum"*	Duration of main liabilities	Mandatory or widespread building defects cover (post completion)	Securities against contractor's insolvency (before completion)	Other mandatory or widespread construction insurances
Czech Republic	**Yes** - Specific provisions relative to constructor's liability in the Civil Code Building Act 183/2006 Coll.	**Weak** - contractual liability mainly governed by legislation	**Yes**	Civil Code: **3 years** statutory building defects guarantee general limitations: **2 years** from discovery of damage but no more than **3 years** from the originating event (**10 years** for intentional damages)	**No** Proposal of introducing construction defects insurance was discussed in 2006	**No**	PI compulsory: architects, consulting engineers, technical surveyors
Denmark	**Yes contractually** Standard contract forms act as a substitute for legislation in the field of construction liability	**Important** – standard contract wordings (ex. AB 92, ABT 93, ABR 89)	**Yes**	Danish Limitations Act 2008: **3 years** from discovery of defect and maximum of **10 years** (cannot be contractually modified in consumer contracts) Standard contracts: **5 years** from handover	**Yes** Building defects insurance - compulsory for new permanent dwellings – cover 10 years from handover (regardless liability) The Danish Building Defects Fund and The Building Damage Fund for Urban Renewal - compulsory for publicly subsidized projects– latent defects cover 20 years from completion (regardless liability)	**No** Except performance bonds required in some standard contracts (ex. AB92)	Required under standard contracts (ex. AB92): Third Party Liability insurance (building contractors and subcontractors) CAR PI architects voluntary: required by the professional body
Estonia	**Yes**- Specific provisions relative to constructor's liability in the Law of Obligations Act The Building Act	**Weak** – minimum contractual liability defined by legislation	**Yes**	**2 years** statutory warranty for construction works **5 years** liability for defects under construction contract or sale of building **10 years** for intentional breach of contract from discovery of damage	**No**	**No**	PI compulsory: certification or inspection bodies, testing laboratories
Finland	**Yes contractually** Standard contract forms act as a substitute for legislation in the field of construction liability	**Important** – standard contractual clauses YSE 98, KSE 95	**No** May be contractually agreed	Standard contracts: **10 years** - liability for building defects Guarantee period of **1 or 2 years** from completion	**Yes** Housing Transactions Act 1994 – for transactions of purchase of housing shares in a housing company: Mandatory construction defects cover (insurance or guarantee) up to 10 years from approval of building - covers repairs costs for which funding shareholder is liable in the event of his insolvency YSE 98- Insurance covering repair of building defects in case of failure of the builder	**Yes** Housing Transactions Act 1994 – for transactions of purchase of housing shares in a housing company: Mandatory cover (insurance or guarantee) against insolvency of the funding shareholder	
France	**Yes**- Spinetta law 1978 Civil Code	**Weak** – contractual liability mainly governed by legislation	**Yes**	Spinetta law 1978: **10 years** – decennial liability **2 years** – warranty of good running of separable equipments **1 year** – all apparent and hidden disorders and non compliance with the contract	**Yes** - Mandatory under Spinetta law 1978: Insurance of latent defects in buildings *(dommage ouvrage)* regardless liability Insurance of decennial liability	**Yes** -Mandatory(law 1990) guarantees for developers building individual houses (so called CMI)	PI compulsory: architects
Germany	**Yes**- Specific provisions relative to constructor's liability in the Civil Code	**Medium** – minimum contractual liability defined by legislation Important role of VOB contractual clauses	**Yes**	Civil Code: **5 years** from handover **10 years** - damages caused by intentional actions (can be modified contractually except architects) VOB: **4 years** usually	**No** (except voluntary financial guarantees used as a security against defects. Some insurance substitutes also available)	**No** Except financial guarantees used to secure due completion of works	PI compulsory: architects and engineers (under professional bodies rules) Third party liability compulsory for all participants in construction operation

Countries	Liability				Insurance		
	Specific constructor's liability framework	Role of contract in formation of liability	Joint and several liability or *"in solidum"*	Duration of main liabilities	Mandatory or widespread building defects cover (post completion)	Securities against contractor's insolvency (before completion)	Other mandatory or widespread construction insurances
Greece	**Yes** Law 3212/03 Law 3669/08 – public contracts Civil Code Customary rules	**Medium** Main liabilities defined by legislation but customary rules are usually followed in the contracts	**Yes**	Civil Code: **10 years** – liability for substantial defects	**No** Projects of legislative reforms involving compulsory insurance were envisaged	**No**	
Hungary	**Yes** Specific provisions in the Civil Code	**Weak** Main liabilities governed by legislation	**Yes**	Liability for latent building defects: **10 years –** shell of the building **3-5 years –** finishing works and building products of long duration **3 years -** main elements of dwelling buildings	**No**	**No**	
Ireland	**No** - No specific construction provisions – general common law applies to construction contracts	**Medium** Minimum contractual liabilities governed by law Standard contracts widely used	**Yes**	Statute of Limitations 1957: **6 years** – claims under tort or contract **12 years** – claims based on contracts under seal (starting from the "cause of action")	**Yes-** Housing warranties: HomeBond, Premier Guarantee (voluntary) Structural defect cover up to 10 years from completion (regardless liability)– dwellings only	**Yes** - Housing warranties cover repayment of deposits or advance payments in case of builder's insolvency	Voluntary PI: architects, building surveyors, quantity surveyors (required by professional codes of practice) Third party liability insurance CAR (required by standard construction contracts)
Italy	**Yes** - Civil code dispositions regarding construction liability and insurance	**Weak** – liability mainly governed by legislation	**Yes**, except architect-designer *(progettista)*	Civil Code: **10 years** from handover – stability defects **2 years** from handover – any defects and non compliance with the project	**Yes** Law no 210 2/8/04 – compulsory decennial insurance for property sold to individual buyers Merloni Law 11/2/94 compulsory decennial insurance for public procurement projects exceeding Eur 10M	**Yes** Law no 210 2/8/04 – compulsory financial guarantees for off-plan property transactions with individual buyers to reimburse the buyer in case of the seller's insolvency	PI compulsory: architects (for public works only)
Latvia	**Yes** - Specific provisions relative to constructor's liability in the Civil Code Construction Law 1995	**Weak** – liability mainly governed by legislation	**No** may be agreed contractually	Construction Law 1995: **2 years** from handover legal defects warranty period Civil Code: **10 years** from the act originating damage for contractual and extra-contractual liability	**Yes -** Insurance covering removal of defects in case of contractor's failure within legal warranty period available (voluntary) (A part of builder's remuneration is retained as a guarantee of defects removal during legal warranty period-voluntary)	**No**	Mandatory third party liability insurance for principals and main building contractors
Lithuania	**Yes -** Specific provisions relative to constructor's liability in the Civil Code Law on Construction	**Weak** – liability mainly governed by legislation	**Yes** – if individual contribution to the damage cannot be determined	Civil Code: Legal guarantee periods for building defects: **10 years** – structural parts **5 years** – all other building parts **20 years** – defects intentionally concealed	**No**	**No**	Mandatory third party liability insurance: designers and building contractors (except "simple" projects)
Luxembourg	**Yes** - Specific provisions relative to constructor's liability in the Civil Code	**Weak** – liability mainly governed by legislation	**Yes**	Civil Code: Contractual liability: **10 years** – apparent or hidden defects affecting *"gross ouvrage"* and fitness for purpose of the building **2 years** – serious defects affecting *"menus ouvrage"*	**No** Project of reforms regarding liability rules under discussion	**No**	Mandatory: PI architects and engineers

Countries	Liability				Insurance		
	Specific constructor's liability framework	Role of contract in formation of liability	Joint and several liability or *"in solidum"*	Duration of main liabilities	Mandatory or widespread building defects cover (post completion)	Securities against contractor's insolvency (before completion)	Other mandatory or widespread construction insurances
Malta	**Yes** - Specific provisions relative to constructor's liability in the Civil Code	**Weak** – liability mainly governed by legislation	**Yes**	Civil Code: **15 years** from completion – liability for defects affecting stability of the building	**No**	**No**	
The Netherlands	**Yes contractually** Standard contract forms act as a substitute for legislation in the field of construction liability	**Important** - role of standard contracts in definition of liability (U.A.V., DNR, BNA, CR2006, GIW)	**Yes** contractually	Standard contracts: Defects guarantee "maintenance" period 3 months up to **2 years** UAV contracts: **5 years** liability for latent defects **10 years** – defects affecting stability and fitness for purpose Civil Code (general provisions): **2 years** from notification of defects by the owner, maximum **20 years** from handover	**Yes** - housing warranties for dwellings. They were made mandatory by a majority of Dutch local authorities for newly built houses. Covers repair of defects in case of contractor's failure/insolvency: 6 years from completion– general warranty 10 years from completion – serious structural defects causing the dwelling unfit for habitation	**Yes** - Housing warranties provide cover of additional costs of completing the construction in case of insolvency of the builder	Voluntary PI: architects (required by the professional body) Voluntary: Third party liability insurance, CAR (requirements of standard contract forms and of professional organisations)
Poland	**Yes** - Specific provisions relative to constructor's liability in the Civil Code Building Law 1994	**Weak** – minimum liability defined by legislation	**Yes**, if individual contribution to the damage cannot be attributed	Civil Code: **3 years** legal minimum warranty for building defects General limitations: **3 years** from discovery of the damage but no more than **10 years** from originating act (**20 years** for damages resulting from crimes)	**No**	**No**	Mandatory PI: all persons fulfilling "independent technical functions in construction" (architects, engineers, urban planners..)
Portugal	**Yes** - Specific provisions relative to constructor's liability in the Civil Code	**Weak** – liability mainly governed by legislation	**Yes**, may be contractually excluded	Civil Code: **5 years** from handover for defects likely to cause partial or total destruction of the building	**No** Project of mandatory construction defects insurance under debate	**No**	Mandatory PI: persons involved in design, supervision and project management
Romania	**Yes** - Specific provisions relative to constructor's liability in the Civil Code and law no 10/1995	**Weak** – liability mainly governed by legislation	**Yes**, may be contractually excluded	Law no 10/1995: **10 years** – liability for hidden building defects and consequential damages Liability for structural and resistance defects resulting from non respect of design and execution norms lasts for the **whole useful life** of the building	**No**	**No**	
Slovakia	**Yes** - Specific provisions relative to constructor's liability in the Civil Code and Commercial Code	**Weak** – liability mainly governed by legislation	**Yes,** may be contractually excluded	Liability for building defects (warranty): Civil Code: **3 years** from handover (may be modified contractually) Commercial Code: **5 years** from handover	**No**	**No**	Mandatory PI: architects and engineers
Slovenia	**Yes** Construction Act Civil Code	**Weak** – liability mainly governed by legislation	**Yes**, may be contractually excluded	Civil Code: **10 years** from acceptance – defects affecting solidity of the building	**No**	**No**	Mandatory Third party liability insurance: all main participants to construction operation

Countries	Liability				Insurance		
	Specific constructor's liability framework	Role of contract in formation of liability	Joint and several liability or *"in solidum"*	Duration of main liabilities	Mandatory or widespread building defects cover (post completion)	Securities against contractor's insolvency (before completion)	Other mandatory or widespread construction insurances
Spain	**Yes** - Law 38/1999 (LOE)	**Weak** – liability mainly governed by legislation	**Yes** if the cause of damage cannot be identified	Law 38/1999 (LOE): **1 year** – all material disorder resulting from defective performance (builders) **3 years** – *"ruina functional"* defects affecting suitability for habitation (all participants) **10 years** – *"ruina material"* defects affecting structure and viability (all participants)	**Yes** - Law 38/1999 (LOE) 10-years liability cover (insurance or guarantee) mandatory for dwellings only Insurance or guarantee covering 1,3 and 10- years liability (for buildings other than dwellings) available on voluntary basis	**No**	Mandatory PI: architects in some regions
Sweden	**Yes contractually** Standard contract forms act as a substitute for legislation in the field of construction liability	I**mportant** role of standard contracts in definition of liability (AB04, ABT06, ABK 09, ABI09)	**Yes**, may be contractually excluded	Standards contracts: Defects guarantee periods (varying depending on the contract, ex. **5 years** for AB04) **10 years** liability for major defects caused by negligence	**Yes** - Law 1993:320 on Construction Defects Insurance: Mandatory Building Defects Insurance for all permanent dwellings (covers construction defects regardless builder's liability up to 10 years from completion) Voluntary – completion warranties covering repair of defects within the contractual "defect guarantee" period in case of builder's failure (mainly for dwellings)	**Yes** - Voluntary – completion warranties covering additional cost of completing the works in case of builder's failure Deposit guarantees and Advance payment guarantees available in the framework of purchases of from "tenant-owners" societies	Voluntary: PI – widespread market practice Third party liability insurance CAR (required by standard construction contracts)
United Kingdom	**Yes** - Specific liability regime (dwellings only) Defective Premises Act 1972	**Medium** Minimum contractual liabilities governed by law Standard contracts widely used (JCT, GC/Works/1, FIDIC)	**Yes**	Limitations Act 1980 : **6 years** – claims under tort or contract **12 years** – claims based on contracts under seal (starting from the "cause of action") Defective Premises Act 1972 (dwellings only): **6 years** from completion of original works or any further works done to rectify defects	**Yes** - Voluntary housing warranties for dwellings (ex. NHBC): 2 years from completion – cost of repair of defects in case of builder's failure, 10 years from completion – damages affecting structural elements of the building (regardless liability)	**Yes** - Housing warranties include cover against fraud or insolvency of the builder before completion of works (dwellings only)	Mandatory PI: architects Voluntary PI: other professional consultants (requirements of professional codes of practice) Voluntary CAR, Third party liability insurance (frequently required in standard construction contracts)

6.3. Results of national overviews

6.3.1. Liability regimes

The summary table above highlights the main aspects of liability and insurance regimes in the 27 EU Member States. This table is a resumed representation of findings of the ELIOS research on national liability and insurance regimes outlined in the country overviews forming "Special report on liability and insurance regimes in 27 EU Member States" annexed to the present report. We have decided to focus the analysis on the following points: existence of a specific legal or contractual liability regime in construction, role of contract in defining liability, existence of joint and several liability concept and duration of main construction liabilities.

It is important to specify that technical requirements, building regulations or technical construction standards and norms are not taken into consideration in this chapter.

- Existence of specific construction liability regimes

As it can be seen from the synthesis table above, liability in construction sector tends to be specifically regulated at least to some extent in most of the Member States, which shows that construction is considered by most of the Member States as an activity requiring some particular attention. Only two Member States do not have any specific liability regime applicable to construction (Cyprus and Ireland). In these countries liability in construction follows general liability rules.

In the remaining countries specific construction liability rules exist, which generally tend to reinforce liablility applicable in the context of construction. In most of the Member States the specific liability rules are governed by legislation i.e. specific legal acts, specific provisions relative to construction in the Civil Code and/or case law.

In the Nordic countries (Denmark, Finland, and Sweden) as well as in the Netherlands the important role of standard construction contracts creates a situation, where standard clauses act as a substitute of a specific legislation in the matters of construction liability. Therefore it can be considered that specific contractual liability regimes exist in these countries.

In the United Kingdom specific construction liability regime introduced by Defective Premises Act 1972 applies to construction participants involved in provision of dwellings.

- Role of contract

The role of contract in formation of liability in construction varies greatly from one Member State to another. It is possible to distinguish three main categories of countries depending whether the role of contract is important, medium or weak.

Member States where the role of contract is important include the Nordic countries (Denmark, Finland, and Sweden) as well as the Netherlands, where, as we have already stated above, in the absence of specific legal provisions relative to construction liability, standard contractual clauses substitute themselves for legislation forming a contractual liability regime.

Countries, where we have qualified the role of contract as medium are Austria, Cyprus, Germany, Greece, Ireland and the UK. In these countries legislation defines (specifically or not) minimum rules of contractual liability in construction; however degree of contractual freedom in formation of liabilities in the context of construction and the use of standard contract forms (except for Greece) remains significant. In Greece, in paralel to existing legal liability rules, customary rules tend to be mainly followed in construction contracts.

The remaining seventeen Member States were qualified as countries, where the role of contract in formation of liability was relatively weak due to the fact that the main aspects of contractual liability were governed by legislation (although the ways and the degree to which the legislation defined

liabilities and duties vary from one country to another). Furthermore, standard contractual clauses were significantly less popular in those countries comparing to the Membe States indicated above.

It can be concluded from the above that actually situation of a "total freedom" in terms of construction liability does not exist in any EU Member State. Contractual liability in the construction sector tends to be relatively well "framed" either by law or by standard contracts. It also should be noted that the lower the involvement of legislation the greater becomes the role of standard contractual forms in this matter.

- Concept of joint and several liability or *"in solidum"*

In almost all EU Member States joint and several liability is applied in the context of construction with the exception of Finland, Latvia and Cyprus. However, in Finland and in Latvia such a liability may still be agreed contractually by the parties.

Within the remaining countries, some national regimes allow a possibility to contractually exclude such liability: Belgium, Portugal, Romania, Slovakia, Slovenia, and Sweden.

Furthermore, in some countries joint and several liability is applied only in the cases where individual contribution to a damage cannot be apportioned or where the cause of the damage cannot be identified: Lithuania, Poland, Spain.

In Bulgaria application of joint and several liability is restricted to specific participants to construction operation (building contractors and supervisors) whereas in Italy architects-designers *(progettistas)* cannot be held jointly and severally liable with the other construction parties due to their particular role limited to esthetical/artistic aspects of construction.

The above situation indicates, on one hand, the tendency to protect the client/investor against failures of various participants to construction process. On the other hand, it may raise some concerns in terms of equity in the share of liability between various parties to a construction operation. In some countries (Belgium, UK, Germany) this subject is widely discussed within the industry.

- Duration of main liabilities

Durations of liability in construction, whether defined by law or contractually, vary greatly among the Member States.

Many countries impose liability duration period of 10 years starting from acceptance or handover, in particular in respect of defects affecting structural parts or structural stability of the works: Belgium, Bulgaria, France, Greece, Hungary, Italy, Lithuania, Luxembourg, the Netherlands, Slovenia and Spain. In Portugal duration of such liability is currently of 5 years but a possible extension of this deadline is under discussion. In Malta liability for stability defects lasts for 15 years. In Romania duration of liability for such defects is the longest as it lasts for whole useful life of the building.

In some countries the scope of 10 years liability above is larger than the structural stability and may also cover the aspects of *fitness for purpose, habitability* or *usability* of the building (Bulgaria, France, Greece, Luxembourg, the Netherlands). In Spain liability for defects affecting *suitability for habitation* is reduced to 3 years.

Furthermore in several Member States there are statutory or contractual minimum "defects warranty periods" covering also smaller defects or incompliances with the construction contract: Austria, Czech Republic, Estonia, Finland, France, Germany, Hungary, Italy, Latvia, Lithuania, Luxembourg, the Netherlands, Poland, Slovakia, Spain and Sweden. It is frequent that the contractor is under a duty to repair defects discovered during such period. The "defects warranty" periods vary from 3 months to 5 years. In many countries liability of the builder during the "warranty period" is strict i.e. it applies regardless of his fault or negligence.

Lastly, some countries impose extended liability periods for damages resulting from gross negligence, intentional damages, intentional breach of contract, defects intentionally concealed and the like: Czech Republic, Finland, Germany, Poland and Sweden. Duration of these periods is of 10 years in most cases although it may go up to 20 years.

6.3.2. Insurance regimes

- Cover of builder's insolvency before completion

It can be concluded that securities covering totality or a significant part of the risk of builder's or property developer's insolvency before the construction works are completed are used in a minority of Member States only.

Such securities exist in Belgium, Finland, France, Ireland, Italy, the Netherlands, Sweden and the UK although in various forms.

In Ireland, the Netherlands, Sweden and the UK such securities are provided by voluntary housing warranties schemes. Cover delivered by such schemes is available for dwellings. It includes an element of protection covering cost of completion of construction works or reimbursement of advance payments in case of insolvency or fraud of the builder.

In Belgium, Finland, France and Italy the securities against insolvency before completion are legally mandatory. Such obligations apply to off-plan dwelling transaction sales (Belgium and France) or to off-plan real estate sales to individual purchases (Italy). In Finland the insolvency cover is compulsory in the framework of purchase of housing shares in so called "housing company".

Financial guarantees are available in most of the EU Member States and in some countries (ex. Germany) such securities are systematically used. However, it needs to be noted that such financial

instruments usually cover only a very small part of the total contract value (up to 15%) and therefore it is difficult to consider them as a true security in the event of insolvency or fraud.

- Cover of post-completion defects

Securities against the risk of post-completion or latent construction defects are available mainly in the Member States from Western Europe.

Two main groups of countries may be distinguished there - countries where such cover is mandatory and countries where it is available on voluntary basis.

Mandatory latent defects cover exists in Denmark, Finland, France, Italy, Spain and Sweden. It is worth noting that such mandatory securities cover usually structural defects and sometimes also major defects affecting fitness for purpose of the building up to 10 years from completion.

Obligation of such security concerns housing premises in Denmark, Spain and Sweden. In Finland it applies in the framework of transactions with "housing companies". In Italy it concerns purchases of real estate by individual buyers. In France such obligation is extended to all types of buildings.

Mandatory latent defects covers may be further divided into property damage covers and liability covers. In Denmark, Italy and Sweden mandatory insurance responds in the event of existing defects regardless liability of any party to construction operation. In Finland and Spain the mandatory cover is a liability cover i.e. it covers liability of the insured parties for construction defects. In France there are in fact two mandatory covers existing in parallel: property damage insurance covering latent construction defects regardless liability *(dommage ouvrage insurance)* and decennial liability insurance.

Mandatory latent defect securities are in most cases available in the form of insurance although in Spain and in Finland it is allowed to provide such cover in form of a financial guarantee.

Voluntary latent defects covers are available in Ireland, the Netherlands and in the UK.

In Ireland, the Netherlands and UK latent defects covers are available mainly for dwellings and they are provided by housing warranty schemes.

The Irish home-warranty includes 10 years cover of major structural defects and 5 years cover of damages in the event of water ingress or smoke penetration caused by major structural defect.

UK home warranty cover comprises two main parts: cost of repair of defects in case of builder's failure within first two years from completion and subsequently latent defects cover (regardless liability of the builder) of structural parts and of defects affecting fitness for habitation of the building up to 10th year following completion.

In the Netherlands the post-completion cover comprises a “general defects warranty” during first 6 years from completion and a warranty of structural defects causing the building unfit for habitation up to 10th year following completion. However the “warranty” available in the Netherlands responds only when the builder fails to repair himself the defects in question.

It is worth to note that the housing warranties schemes benefit from the public support in the above countries. The leading housing warranty schemes i.e. GIW in the Netherlands, NHBC in the UK and the National House Building Guarantee Scheme (Homebond) in Ireland were created as joint initiatives of public authorities and associations representing construction market stakeholders. This is also the case of Swedish AB Bostadsgaranti scheme delivering among others the latent defects insurance mandatory for dwellings under the Law 1993:320.

In the Netherlands housing warranties were made compulsory by the majority of local authorities for newly built houses. In the UK and in Ireland, although no legal obligation exists, the requirements of mortgage institutions contribute to widespread and quasi-compulsory in fact, character of these security instruments.

As far as new Member States are concerned, it seems that Latvia is the only country, where a voluntary insurance covering removal of post completion defects during the statutory “warranty period” of 2 years is available.

In some Member States projects of reforms aiming in introducing mandatory latent defects insurance legislation have recently been under discussion: Belgium, Czech Republic, Greece, Luxembourg and Portugal.

The table below illustrates the main legal and voluntary latent defects cover schemes in different EU member States identified by the ELIOS team. It also indicates countries, where projects of such schemes have been discussed:

Figure 14 - Latent defects insurance schemes

Legal obligation	Widespread voluntary schemes	Under project
France - Spinetta Law 78-12	**UK** - National House Building Council (NHBC)	**Belgium**
Sweden- Law 1993:320 *Lag om byggfelsforsakring*	**The Netherlands** – members of GIW institute (operating on independent basis since 1 January 2010)	**Czech Republic**
Finland - Housing Transactions Act 1994	**Ireland** - National House Building Guarantee Scheme (Homebond)	**Greece**
Spain - Law 38/1999 (LOE)		**Luxembourg**
Italy - Law 210 2/8/04		**Portugal**
Denmark- Danish Building Defects Fund (1986) Danish Building Damage Fund for Urban Renewal (1990) Mandatory building defects insurance legislation (2008)		

- Other forms of mandatory or widespread insurances

Professional indemnity insurance (PI) is mandatory or very generally used in many Member States[50].

The Member States, where the architect's PI is legally mandatory are: Belgium, Czech Republic, France, Italy (for public works only), Luxembourg, Poland, Portugal, Slovakia, Spain (some regions) and UK.

The Member States where this insurance is in a widespread use due to market customs and, in particular, due to requirements of the professional chambers are: Denmark, Germany, Ireland, the Netherlands and Sweden.

Furthermore, some countries impose an obligation to carry third party liability insurance (TPL) on participants to construction projects. In Bulgaria, Germany and Slovenia third party liability insurance is legally compulsory for all main participants to construction operation. In Latvia there is an obligation to carry TPL insurance for principals and for building contractors. In Lithuania such an obligation is imposed on designers and building contractors.

[50] Two recent studies on the subject of architect's liability insurance were commissioned by the Architect's Council of Europe in 2004 and 2009. Further details can be found on the website of Centre d'Etudes d'Assurances www.cea-assurances.fr.

In some countries TPL insurance is frequently required by standard construction contracts. This is in particular the case of: Denmark, Ireland, the Netherlands, Sweden and the UK.

6.4. Mapping of existing post-completion construction insurance schemes

The picture below illustrates legally mandatory or widespread insurance schemes existing in various EU Member States as well as countries, where implementation of such schemes has recently been discussed. As precised in the previous chapter, most of the existing mandatory or voluntary latent defects schemes concern housing with the exception of three countries: France, where the the obligation of insurance is larger and concerns all types of buildings not specifically excluded by law, Finland where the legal obligation to insure concerns only a particular type of housing provided by so called "housing companies" and Italy, where the mandatory insurance applies to real property purchases by individual buyers.

Figure 15 – Mapping of latent defects insurance schemes

6.5. Insurance schemes and good practices

As stated in the part 2.1. we have defined insurance scheme as a voluntary response provided by the market to a need of guarantee or security.

Insurance scheme should not be confused with an "insurance regime", which is a larger concept frequently linked to national regulatory framework and which in some countries may find its origins in legal texts.

During our research we have identified different initiatives involved in the following domains:

- technical evaluation of performances of innovative products and processes,
- performance certification of products and processes
- cover of latent defects/ housing warranty,
- monitoring of construction deficiencies and risk prevention,
- promoting high professional standards and diffusing information on reliable construction services providers,
- promoting development of sustainable construction,
- clients' support and advice.

The schemes identified have been summarised in a table in the Annexe II below. It is important to note that this table has been completed mainly on the basis of information provided from various stakeholders and it must not be considered as exhaustive in any case. Details of the initiatives summarised in the Annexe II can be found in the national liability and insurance regimes overviews forming The Special Report on Liability and Insurance Regimes in 27 EU Member States.

The schemes and good practices identified vary greatly from one Member State to another. Missions and activities performed and purposes followed are different from country to country and some schemes combine several functions. For example, the housing warranty schemes, in addition to delivering insurance cover also play an important role in monitoring quality and in setting up technical standards, which must be met by their members.

We would like to highlight below some interesting examples of recent initiatives and particular schemes identified. The initiatives described below are either directly related to insurance or contribute to supporting construction insurance activities by delivering information helpful in risk and quality assessment and control by the insurers.

Denmark

The Danish Building Defects Fund *(Byggeskadefonden)* www.bsf.dk

The Danish Building Defects Fund is a privately owned institution, which was established as a part of a Quality Assurance and Liability Reform in Danish law in 1986 in order to address the problem of extensive damages to housing buildings built in the 1960s and 1970s. Contribution in the Fund is

compulsory for all publicly subsidised housing buildings such as publicly subsidised housing estates, youth housing, housing for the elderly, privately owned co-operative housing associations and co-operative house shares and other market actors.

The Fund is financed by contributions paid as a percentage of initial construction expenses of all publicly financed buildings. 1% of the total value of each construction project financed by the public sector must be paid as a contribution into the Fund.

The mission of the fund consists in monitoring and prevention of construction defects and in compensating all building defect claims relative to buildings under its responsibility for the period of first twenty years.

The Fund carries out the following measures dedicated to monitor and to prevent construction defects:

- compulsory building inspections performed by the Fund in the first and the fifth year from completion of the building,
- a database of construction defects based on information available from complaints of the clients and from the compulsory building inspections performed by the Fund,
- diffusion of information and of feedback of experience relative to building deficiencies for the purpose of preventing future defects.

It is estimated that the measures implemented have helped to significantly reduce the level of construction defects in the monitored buildings (from 30% at the beginning of nineteen nineties to 3-4%).

Moreover, the Fund provides a security against construction defects similar to latent defects insurance - it covers 95 % of the cost of repair of defects occurring in the public housing buildings up to 20 years from completion. In the case of occurrence of defects the Fund finances the repair cost and subsequently claims compensation from the construction parties liable for the damages.
A further similar fund called the Building Damage Fund for Urban Renewal *(Byggeskadefonden Vedrørende Bygningsfornyelse)* was established in Denmark in 1990 in order to cover publicly subsidised buildings subject to urban renovation works. The owners of such buildings must pay 1.5% of the total renewal cost as a contribution into the fund. Similarly to the Danish Building Defects Fund this Fund carries out inspections during the first and firth year from completion of renewal works, collects information on defects occurring and diffuses knowledge in view to prevent damages and provides financial compensation in the event of occurring damages up to 95% of repair costs. Every year the Fund issues a report with recommendations relative to buildings quality.
The Fund also organises information meetings for building owners and technical advisers before the urban renewal works begin in order to provide them with information on the most common building damages and the ways how they can be avoided.

It is worth to note that in April 2008 a legal obligation to insure risk of construction defects was extended in Denmark on all new buildings used as a permanent residential occupation (except buildings already covered by the Funds above and private dwellings constructions organised and managed by the owner himself). The compulsory insurance lasts for 10 years from completion and it is associated with the duty of the insurer to arrange repair of defects identified. Similarly to the Funds described above, the insurers covering building defects are allowed to claim compensation from the liable constructors.

It seems that some features related to the experience of functioning of the building defect Funds have also been implemented in the framework of the new insurance obligation from 2008, in particular:

- a duty to inspect the housing buildings subject to the compulsory insurance during the first and fifth year from completion,
- requirement to establish reports on defects identified during the inspections and of a list of defects covered by the compulsory insurance for the information of the insurer, the building owner and the construction parties who had contributed to performance of defective works,
- a public list operated by the Danish National Agency for Enterprise and Construction available on the Internet - this list contains contact data of companies involved in construction works, in which defects covered by the compulsory insurance have been found. The list also contains description of defects identified and post code of the building, in which defects were identified.

The Benchmark Centre for the Danish Construction Sector *(Byggeriets Evaluerings Center)*

Dissatisfaction from high level of construction defects and high construction costs has led the Danish government to implement further measures in order to improve quality and competiveness of the construction sector. Government report from 2000 “The Danish Construction Sector in the Future- from Tradition to Innovation” identified a number of issues such as high overall cost of construction, high level of defects, difficulty to identify parties liable for defects, long and costly litigation procedures, lack of transparency in the industry, lack of clear understanding of the price-quality relationship in the decision-making process, underperforming competition based mainly on price criteria with few dominant players in the market, tradition-oriented approach to the construction business, lack of real competitive dynamic in the market discouraging market development, innovation and investment in competencies and skills.

The government highlighted an urgent need to boost the competitiveness and productivity of the market and to prepare the Danish construction sector to the challenges of international competition, new technological developments and requirements of modern IT driven society.

The report recommended creation of the Benchmark Centre for the Danish Construction Sector in view to enhance transparency in the market via a benchmarking system and productivity studies.

The BEC Centre was set up in 2002 as a joint initiative of all main players of the construction industry such as clients, contractors, architects, engineers, construction materials producers and the government. The BEC centre is a non profit organisation and it is dedicated to:

- enhance transparency in the construction industry by offering a set of comparable criteria helping the market parties in their decision–making process and in their choice of appropriate service providers,
- identify good practices thanks to a benchmarking system composed of a register of construction firms and of a set of Key Performance Indicators (KPI):

    - The register - register of construction firms is maintained in the view to assess firm's capacity based on its previous performance. The database is created based on information included in the certificates of completion which are sent to the BEC centre. Based on this information each registered firm is assessed according to four main criteria: respect of deadlines, quality, respect of safety and security rules and client's satisfaction.
      The records are kept in the register no longer than 3 years and then they are automatically deleted in order to make sure that the register is up to date and that the evaluation is based on the recent information.

    - Key Performance Indicators (KPI) - the BEC centre has developed and operates a benchmarking system based on 14 key performance indicators. The indicators concern four main fields: deadlines, quality, safety and security conditions and profitability. The evaluation based on KPI indicators is performed thanks to questionnaires sent to all parties involved in a project and to the certificate of completion provided by the client. The data extracted from the above documentation is used to calculate the firm's performance score.

Following Statutory Order from 2005 all contractors bidding for Danish public projects have to justify their capacities in the form of KPI indicators relative to their previous construction projects. The construction benchmarking is not compulsory for private projects but it has become popular in the private sector (in 2005, 800 from around 1000 construction projects were evaluated by the BEC on voluntary basis).

In addition to the missions above the BEC disseminates information about construction and construction research and animates network groups within the construction sector.

France

Agence Qualité Construction (AQC) www.qualiteconstruction.com

Agence Qualité Construction is an association financed by voluntary membership fees collected by insurers. It regroups all professional organisations from the construction sector in France. The mission of the association consists of the prevention of defects and damage and in improving quality of construction.

The work of this organisation is structured around three main functions: observation, prevention and communication.
The prevention tools and actions undertaken are developed with participation of the members working in commissions and subsequently diffused via professional organisations or via communication channels of the association.

Quality observatory
In addition to two committees C2P (Committee of Prevention of Products installed) and CPC (Committee of Construction Prevention) working on prevention issues the association disposes of a *construction quality observatory* which constitutes a basis of its activities. The observatory has developed a number of intelligence tools in order to collect exhaustive information on construction declared damages occurring during all stages of construction projects with the goal to analyse the reasons of disorders, to monitor and prevent serial disorders as well as to assess the actions and systems implemented in order to improve construction quality.

Sycodes scorecard
Since the early years of its existence the association issues a database called *Sycodes scorecard.* The name of *Sycodes* is an abbreviation of *SYstème de COllecte des DÉSordres* which can be translated as System of Collection of Defects Information.
The main goal of creation of this tool was to provide construction professionals with a statistical feedback of experience on technical causes of construction declared disorders consolidated at the national level.
Data on construction declared disorders collected by *Sycodes* are available thanks to cooperation of the AQC with construction insurers and relate to claims notified within the scope of decennial liability governed by the Spinetta law of 04/01/1978.
Since 2007 *Sycodes* is also used as a tool of evaluation of progress achieved in improvement of construction quality. The progress is measured as a comparison between an action plan for a given period and the actual evolution noted by the Observatory using a number of indicators such as *relative cost of disorder (CRD).* If discrepancies are noted between the plan and the actual achievement, the corrective measures would be implemented.

Quality labels inventory

In December 2009 the Agency published an inventory and evaluation guide on various quality labels and certification procedures available to the French construction sector. A large number of various labels and certificates exist in the French market with diverse application fields. For example some of the above labels concern characteristics or performance of products whereas others focus on such aspects as staff competence and know-how, organisational and management quality, quality of services, guaranties offered to customers, health and safety, environmental security and etc... Taking the above into account the Agency considered that an evaluation tool of such labels is necessary. The tool will cover voluntary and compulsory labelling systems relative to organisations from private and public sector. It is intended to be updated and completed every three months.

Quality assessment procedures for innovative solutions

The Centre Scientifique et Technique du Bâtiment (CSTB, www.cstb.fr) provides assessment procedures in order to help various professionals in introducing innovative construction products and systems to the market.

In the context of lack of a satisfactory return of experience, the way of assessing innovative technologies available in France, recognised by the construction sector and by the insurance companies mainly consists in the Technical Assessment (Avis Technique) and the Technical Appraisal for Experimentation (Appréciation technique d'Expérimentation). The first procedure, which generally requires tests, takes around 18 months and is a complete assessment providing recommendations for the specific use of a product or system. The second procedure is dedicated to the first experimental but concrete uses of a new system.

These procedures are voluntary, independent and complementary towards each other as they apply to different stages of development/maturity of proposed technologies. The assessment procedures are taken into consideration by construction participants and insurers in understanding the risk or recommendations related to implementation of innovative products and systems.

Within the context of the French Environment Round Table launched in October 2007[51], a great number of innovatives eco-technologies were proposed on the construction market. Existing procedures happened to be partly inadequate to face such a flow of demands for performance assessment to be quickly delivered.

The answer to this situation was the "Pass' Innovation" procedure, launched by the CSTB in July 2008.

The Pass' Innovation, enables companies, technical auditors and insurance companies to have an initial technical evaluation of innovative products or systems. The benefit provided by the Pass' Innovation consists in a reduced time span in which building companies, technical controllers and insurers can quickly dispose of a pre-evaluation before eventually moving toward the Technical Assessment.

[51] www.legrenelle-environnement.fr/spip.php?rubrique112

The Pass' Innovation procedure is composed of three stages: 1) definition of the product or system (principles of functioning, destination, components, installation and maintenance conditions, performances etc.), 2) analysis of the products or systems, and 3) the final report in a form of a "colour code":

- Green light indicating that the risk is very limited and may be controlled by implementation and/or monitoring recommendations and that the technology is suitable to be implemented in the market. If necessary, the Technical Assessment procedure is launched at the same time. Within two years of the final report, the client agrees to give CSTB feedback on every building site that has used the system, in accordance with the terms specified in the report.

- Amber light meaning a "medium" risk level with the suggestion that the applicability of the product or the systems should still be verified on a pilot building site.

- Red light meaning that the risk is not controlled and that the technology has not been sufficiently perfected yet. The diagnosis is accompanied by an analysis of the product's shortcomings, and, if necessary, possible actions to mitigate them.

A summary of the final report is available on the CSTB website. In addition to the technical evaluation, the procedure is followed by a monitoring of the building sites where the products are implemented in order to collect the feedback, which will be used for the Technical Assessment, if applicable.

This new mechanism has been received very favourably by the building industry, in particular the AFSA (French Association of Insurance Companies), FFB (French Building Federation), CAPEB (Small Building Trades Confederation) and the Agence Qualité Construction (Construction Quality Agency).

The Pass' Innovation could concern three main categories of technologies: 1)Products and proceedings that are already widely implemented in other countries, but for which there is lack of implementation experience in France, 2) innovative products derived from existing technologies and 3) completely new products or technologies which need an independent evaluation.

In April 2010, delivered Green Pass' Innovation concern photovoltaic systems (21), insulation systems (2), structural systems (5), roofing system (1).

Qualification procedures

Various qualification procedures are delivered by specialist organisations. They are dedicated to different categories of construction professionals with the aim to approve competences and internal quality management systems. Examples of such procedures include:

- MPRO-Architecte – qualification procedure for architectural practices,
- Qualibat, Qualifielec, Quali-PV, OPQIBI – qualification procedures for construction and engineering firms,
- QUALIMO – qualification of social housing organisations,

- QUALI-PROM – qualification of private property developers,
- Certivéa – certification of buildings in terms of conformity to best environmental practice.

The Netherlands

The GIW institute (until the 31th of December 2009)

The Guarantee Fund for Housing Development (GIW-*Garantie Instituut Woningbouw*) was founded in 1974. Its creation, inspired on the NHBC model from the UK, was supported by the Dutch government. The organisation was composed of three consumers' organisations, three affiliated warranty provider organisations: *Bouwfonds*, SWK (*Stichting Garantie Instituut*) and *Woningborg* and of an association regrouping local authorities.

The goals of the system consisted in improvement of construction quality, providing of additional security to the home -buyers in the event of builder's insolvency or of construction defects, increase of customer confidence in construction firms and in providing assistance to buyers in case of a dispute with a member construction firm. In view to achieve the goals above the GIW institute developed the following measures:

- registering and assessment of construction firms affiliated within the system,
- creation of standard contract forms applicable to agreements between the buyer of dwellings and the builder,
- mediation in case of dispute between the client and the builder,
- providing indemnity for construction defects considered as a solution of last resort, when a construction firm failed to repair defects and all other means (such as mediation or arbitration procedure) proved to be inefficient.

The affiliated warranty providers delivered warranties to owners of newly built houses covering the risk of insolvency of the builder and of building defects. A very large majority of newly built houses in the Netherlands are covered by such a warranty. Majority of Dutch local authorities have made the warranty compulsory for every newly built house.

Construction firms registered within this scheme could benefit from a "GIW label" providing that they met a number of conditions such as satisfactory results of audit of their technical competences and of their financial standing and use of standard GIW contract forms.

It is estimated that almost all larger construction firms and property developers in the Netherlands were affiliated to the GIW system. The affiliation was frequently imposed on property developers by local authorities. The buyers of dwellings were also encouraged by the government to require their builder to provide the GIW guarantee. In some cases the use of the standard GIW contract form may have been a condition to obtain subventions on dwelling purchase.

As from the 1st of January 2010, the GIW institute will cease his activities. The three member warranty provider organisations will continue their activities on an independent basis.

United Kingdom

NHBC – National House-Building Council www.nhbc.co.uk

NHBC is an independent non-profit distributing company established in the UK for the purpose of raising house-building standards and of protecting buyers of new or newly converted homes by means of home warranties and insurance.

Initially created as a standard setting and inspection body, NHBC with the support of the government, the industry and the Building Societies Association, introduced in the mid 1960s a 10-year warranty to protect new home owners. It is estimated that by the early 1970s, a large majority of all new homes for sale were built to the NHBC Standards and covered by its warranty. Initially, the warranty was underwritten by external commercial insurers. Since 1978 NHBC became an insurance company and started to deliver the warranty itself in 1978.

The housing warranty was seen as a way to avoid long and costly court disputes in case of construction defects and therefore was supported by mortgage lending institutions as it also protected the lender's interest in the property.

The business model of the NHBC differs greatly from classical commercial insurance company as its core consists in actively managing construction risks rather than simply segmenting and pricing them.

The main activities of the NHBC system are as follows:

- registration of builders, who by joining commit to following the Rules of Registration and the NHBC standards (currently over 20,000 builders are registered in the UK),
- setting pragmatic technical standards that newly build homes must meet,
- inspecting plans and buildings during construction in order to verify compliance with the NHBC's technical standards,
- providing warranty and insurance to the homebuyers,
- monitoring claims on the homes built, which provides feedback used to continuously improve technical standards as well as information and training provided to the adhering builders.

The NHBC activity model follows a concept of a "virtuous circle", where elements of standards setting and training, builders' registration, risk assessment, building sites inspections, warranty and insurance for the homebuyers, and feedback from experience and claims are interconnected and help to provide cost efficient ways of increasing building standards together with lower insurance costs.

As it was indicated to us by the NHBC the economics of the system are substantial, the main advantages consisting in reduced loss ratio and in increased customer satisfaction. As a consequence of lower cost

of losses indemnified achieved thanks to their active risk management approach NHBC can offer a substantial reductions in insurance premiums comparing to “commercial insurance”.

NHBC has undertaken a number of initiatives aiming in promoting sustainable construction and in particular in providing consultancy, training, assessments and research in the field of construction to sustainable standards. NHBC also actively cooperates with the Zero Carbon Hub organisation in charge of delivering new zero carbon homes according to the government’s strategy aiming in progressive tightening of building regulations in view to achieving zero carbon homes by 2016. However many of the risks linked to innovative methods and products implementation are still considered by the NHBC as too “speculative” to be covered by their warranty and insurance solutions due to insufficient feedback of experience.

Technical evaluation measures

As far as technical evaluation is concerned, the procedure is generally managed by a technical body (see chapter 3.3). The outcome of the evaluation procedure is a document (“Agrément” in Belgium and UK, “Zulassung” in Germany, ”Avis Technique” in France …). A common feature to these documents is the description of the expected performances of the concerned product or process as well as the description of the necessary measures that stakeholders (designers, contractors) have to take into account in dor to meet the awaited performances.

Within the evaluation procedure, experts also examine the quality management system of the product/process provider in order to assess the potential of deviation of production performances. Other relavant information concerning the training to the right implementation of the product/process may also be examined. This information can be certified through an ad’hoc procedure.

The evaluation document(s) as well as the certificate(s) related to a given construction product/process are used by insurers to assess the associated risks concerning contractors liability and building defects.

6.6. Can we build sustainably without sustainable guarantees?

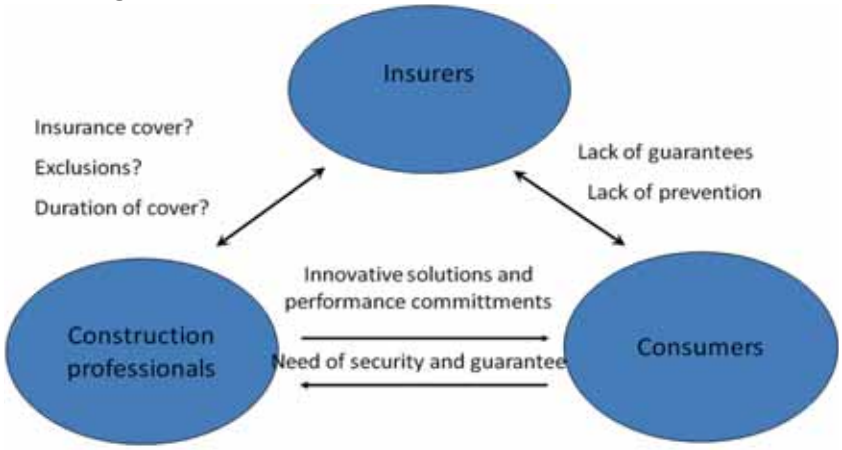
Despite the different attempts to accompany sustainable development by insurance products and the numerous examples of good practices favorable to a satisfactory assessment of risks, the results of our study show that there is a gap between the new eco technologies offered by the construction sector and the guarantees provided by the insurance market. As a general rule, the insurers are not involved in many technical solutions and juridical commitments proposed in the current construction activities. And this gap is more and more important.

The two main constraints to set up adapted insurance guarantees are indeed the increasing speed of innovation generated by the sustainable development and the trend to sell them with promises of performance.

About innovation, it is, at a first glance, natural and logical that the insurance sector adopts a prudential attitude, since, by hypothesis, there is neither experience nor feedback to assess the effectiveness of these new technologies. The political will to stimulate products and process favorable to sustainability, the financial and tax measures and the commercial outlooks that these eco innovations offer conduct to a situation where an increasing part of them are not guaranteed. More precisely, they are guaranteed by the constructor itself, but not by an insurer or a financial guarantor.

On the other hand, for obvious reasons, the professionals of the construction sector, more and more frequently, undertake commitments in terms of performance. From this point of view, although the commitments are generally guaranteed…the quarantees provided often rely only on the professionals themselves.

Figure 16 - Interactions in terms of risk and insurance



The drawbacks of this situation are clear. According to the risk of insolvency described previously, it means that the protection of the owner is not properly organised. Taking into account the growing need for security and guarantee demonstrated by a large part of the national insurance regimes throughout Europe, that is somewhere paradoxical.

Furthermore, that could create a disadvantageous position for the craft and small enterprises.

And this trend is somewhat ominous in a middle term approach. As we have tried to underline, the role of the insurance sector is today not only to cover the claims, but to assess the risks too. More and more, the insurance sector acts as a regulator in the construction activities. Thus, leaving some technologies without guarantee is dangerous. If there is a kind of construction that needs durable or sustainable guarantees, it is, precisely, the sustainable construction.

Within the next few years, one or several major claims could happen without any guarantee or compensation for the victims.

For these reasons, we are convinced that it is vital to promote insurance schemes and good practices favorable to sustainability and that an intervention is necessary to curb the naturel trends of the market.

It is although important to note that this intervention has to be done at a European level, in order to stimulate a mutual recognition of the signs of quality and to facilitate the exercise of the freedom of services, through the great diversity of the national insurance systems.

7. Final recommandations

7.1. Introduction

As we have discussed in the previous chapter, the findings of our research suggest that some action would be needed in order to remedy the significant drawbacks of the current situation. Firstly and fundamentally, a distortion or a gap between two important phenomena in the construction activities can be seen, namely an absolute neccessity to integrate construction activity into the sustainable development and the need to reinforce security and guarantee.

Although the national contexts outlined above are very different, this conclusion seems to be common for all existing systems. A true sustainable development which is not supported with sustainable guarantees seems inconceivable; the obvious risk of such a situation would be that in the future some alleged sustainable eco-innovations may actually prove to be disappointing and sometimes lead to dramatic experiences.

Furthermore, the forces of free market and uncoordinated development of legal frameworks may lead to increasing difficulties for small and craft firms, to barriers in exercising cross-border activities and to difficulties in assessing quality and controlling construction deficiencies at a European level.

In light of the great diversity of existing national responses, it is logical and necessary that an involvement should be undertaken at the European level. Europe must ensure that concrete means are available for the efficient and lasting support for small and craft firms in order to enhance development of renewable energies and the related guarantees.

With this outlook in mind, we propose to explore five possible orientations by demonstrating advantages and drawbacks of each one.

The first possible orientation that we wish to analyse is the proposal consisting in creating Insurance Guarantee Fund (see part 7.2.), which was the subject matter of a Pilot project intended to facilitate access to insurance for small and craft firms in the construction sector. This proposition was examined by the European Parliament in 2008, following a report drawn up in 2007 by the European Builders Confederation (EBC). The aim of this project is to create a European financial instrument intended to facilitate access to insurance for small and craft firms wishing to implement eco-technologies. Although many aspects thereof are interesting, we will see that implementation of this project involves various formal and practical constraints.

Subsequently, although we do not intend to undertake a detailed analysis of the direction proposed in 1991-1993 by the Group of European Inter-Professional Building Associations (GAIPEC Group), which consisted in suggesting a harmonisation of liability and insurance regimes in EU Member States, we nevertheless find it useful to bear in mind the main issues associated with the solution mentioned and the reasons why it is still difficult to envisage, in spite of its potential interest in the context of development of a single market, with no internal borders and free circulation of services (see part 7.3.).

In the absence of uniform rules on liability and insurance across Europe, an alternative approach might consist in identifying fundamental principles that could lead to a consensus; these principles could be incorporated into a standard insurance contract developed at the European level with the involvement of various professional organisations, including those representing construction and insurance sectors as well as customers thereof. In spite of its apparently concrete nature, this solution would probably require to revise the traditional relations between the concepts of liability and insurance (see part 7.4.).

At the stage of progress report, we have recommended to consider an adoption of a charter by the European insurers involved in construction risks, as a declaration of intent to support renewable energies and sustainable development in construction. We wish to recall the reasons which have finally led us to abandon this recommendation (see part 7.5.).

Finally, the last orientation that we intend to analyse consists in the creation of two organisations at the European level, within which concrete initiatives could be undertaken in order to facilitate the setting up of insurance schemes able to address the need for viable guarantees supporting the development of eco-technologies, while simultaneously encouraging a consistent European policy of prevention and of quality improvement.

The first of the proposed bodies, Elios Cooperation Committee (Elios CC), would be in charge of facilitating discussion and cooperation between the stakeholders from construction and insurance sectors, with the aim to encourage the creation of new solutions intended to improve the existing offer of security instruments such as insurance and financial guarantees as well as the stimulation of development of innovative and sustainable construction. The idea of the second body, Elios Technical Agency (Elios TA), which would be closely connected or perhaps even inseparable from the first one, is to develop an approach on a European level in the matters of risk prevention and of construction quality. It seems that amongst all of the solutions outlined so far, this could perhaps be the most practical and viable orientation; under condition that the proposed organisation remains purely technical in character and free from any political and market influence (see part 7.6.).

7.2. Insurance Guarantee Fund (Pilot Project)

In 2007 Confédération de l'Artisanat et des Petites Entreprises du Bâtiment (CAPEB) - French member of the EBC, has highlighted the difficulties encountered by small and craft construction firms when accessing the insurance market. As emphasised in the study report drafted by the CAPEB, difficulties in obtaining insurance cover were considered, especially by tradesmen, as a barrier in the development of

their activities in the construction sector, which also discouraged them from developing business on cross-border basis and from implementing innovative technologies.

Although this situation was first noted in France, the EBC found that small and craft firms were confronted with similar difficulties in other EU Member States and that, furthermore, they were generally treated less favourably by insurers comparing to larger companies. Added to this, the EBC has emphasised that the above difficulties of small construction firms in accessing insurance cover were an impediment to the dissemination of new eco-technologies.

Concomitantly, a solution to the problem of small firms who had difficulties in finding financing was implemented thanks to the European Investment Fund (EIF). To encourage financial institutions to grant loans to small construction firms, a guarantee fund was set up in order to provide additional security to credit institutions wishing to support activities of small companies.

In light of the success of the above initiative, the EBC considered that a similar solution could be developed in order to facilitate access to insurance for small and craft construction firms. The idea consisted in affecting a Community budget, with a view to enabling small and craft firms to benefit, during a limited period of time from an easier access to construction insurance. The EBC based its approach on the Lisbon action programme (Communication to the European Council "Work together for growth and employment. New momentum for the Lisbon strategy" of February 2, 2005 COM (2005) 330 final), concerning in particular know-how and innovation as major factors of economic growth. Noting delays of the Member States in achieving the goals of this initiative, which consist in making the EU market the most competitive economy in the world by the end of 2010, the Commission reasserted the need to encourage development of eco-friendly technologies.

Within this context, the Lisbon strategy specified that "*the Commission and Member States must increase their involvement in encouraging eco-innovation, which can significantly contribute in improving our quality of life, to economic growth and employment, for example in the fields of the sustainable use of resources, climate change and energy efficiency.*"

Further to a proposal presented by the European MP, Mrs Guy-Quint, in March 2008, the European Parliament (OJEU, II/140 of March 14, 2008) approved a specific budget line of EUR 1,500,000 which could be used to implement a pilot project intended to facilitate the access to insurance for small and craft enterprises, in order to encourage innovation and the promotion of eco-technologies in the European Union (Pilot Project as defined in Article 49, paragraph 6, of the EC Euratom Regulation, no. 1605/2002 by the Council of June 25, 2002 on the applicable financial rules for the European Communities general budget – OJ L 248 of 16.9.2002, page 1, recently amended by EC regulation no. 1525/2007 – OJ L 343 of 27.12.2007, page 9).

Like the EBC, the European Parliament based itself on the finding that the building sector is at the forefront of the development of energy savings and renewable energies. In fact, although industry and transport are currently the leading energy consumers, the building sector alone represents 40% of European energy consumption (lighting, heating, air-conditioning and domestic hot water). However,

the dissemination of eco-technologies and innovations in the building sector faces several constraints, including the additional financial cost, in particular for insurance coverage, consumer demand and the skills available within companies.

The proposal consisted in the creation of a Community financial instrument dedicated to facilitating access to insurance for small and craft firms wishing to implement eco-technologies in their activities. The European Parliament considered that this project should be prepared according to the same model as Community mechanisms intended to support the development of SMEs and innovation (venture capital/loan guarantee).

The pilot project did not precisely define the modes and criteria of awarding the financial assistance, for which the budget had been adopted. It simply defined its overall operating principles.

In the beginning, it was explicitly stated that this European fund could not directly benefit small and craft firms. The idea was to provide, via a guarantee system, an additional coverage or reinsurance subject to various conditions such as:

- Company size, according to a turnover threshold to be defined;
- Type of works undertaken (associated with eco-technologies) and project size;
- Specified compensation limits in the event of a claim;

In the above context, the Commission has launched the present study in order to analyse the feasibility of the pilot project and of possible alternative initiatives intended to facilitate access to insurance for small and craft firms and to encourage the development of innovation and sustainability in the construction sector.
The pilot project defined by the European Parliament has obvious advantages in regards to the Commission's goals. It enables the development of eco-technologies in the construction sector to be supported and encouraged in favour of lower energy consumption and, on the other hand, it aims in facilitating access to relevant insurance solutions for craft and small firms.

Firstly, the Commission can take into account the success of the contribution from the European Investment Bank (EIB) and the European Investment Fund (EIF) regarding small companies' access to the credit market. Indeed, this initiative operated adequately and has reached its intended goals in a satisfactory manner.

Furthermore, this solution has the benefit of addressing similar needs for insurance cover related to the development of eco-technologies and innovative processes, expressed by construction firms and consumers throughout Europe.

Lastly, the virtue of this solution is that it can be set up relatively quickly and therefore meets a cyclical but real problem of access to insurance for small companies.

In spite of all the above advantages, a number of constraints linked to the implementation of the solution proposed by the EBC and adopted by the European Parliament must be taken into account:

- Firstly, although it is possible to draw inspiration from the success of financial incentives provided by European institutions to encourage the financial sector to grant loans to small construction firms, it nevertheless appears more difficult, on a technical level, namely **to implement an equivalent mechanism in the context of the insurance sector.**

In fact, the solution that was implemented in the banking system proved to be effective in the European context as financial organisations operate according to identical rules in terms of requirements and criteria for granting loans or credit lines. This similarity enabled the EIB to specify uniform and non-discriminating conditions for releasing funds to financial institutions.

This is obviously not the case for insurance companies, where the rules are fundamentally different in terms of risk analysis and assessment, reserves and reinsurance. Therefore, it appears extremely difficult or impossible, to define uniform criteria and conditions for providing an incentive to insurance companies. Furthermore, would be vital to organise a control of the effectiveness of such measure. It does not seem possible to guarante that adopting such solution would necessarily lead to decrease of the insurance premiums for the small and craft firms.

Lastly, even if the insurance sector has shown its interest in encouraging the development of sustainable and innovative construction, it seems that this sector would naturally be more confident in a real competitive sustainable construction market, rather than in a kind of “a subsidy” for insurance companies willing to supply insurance products for which a market-driven offer is not yet fully accessible.

- Furthermore, in light of the current diversity of national insurance and liability regimes, it would be **difficult to define consistent and uniform criteria,** applicable to the construction parties concerned, who could potentially benefit from this facility; and it would be difficult to define which type of insurance solutions would come within the scope of this programme. Indeed, it appears difficult to imagine joint criteria on which such a solution should be based on a European scale.

In addition, this perspective would be the source of major discrimination both between the various Member States and between the various participants and incompatible with the general principles of the internal market.

Funds thereby allocated would obviously be “seized” at first place by markets which are already undergoing a significant development of construction insurance, due either to legislation or to professional practices.

Subsequently, what does actually justify the idea that such aids should only be granted to building contractors? Other categories of participants in construction operations of a modest size (consulting

engineers, project managers, technical research departments, etc.), would be fully entitled to receive the same aid, all the more so insofar as the latter are often subject to a legal civil liability insurance obligation (see part 6).

- As far as insurance companies are concerned, their capacity to provide insurance cover partly depends on the reinsurance they can access at global level. Reinsurers, who can view the market from a broader perspective, may react by withdrawing their insurance capacity from sectors which show significant losses. In this way, insurance and reinsurance companies contribute to market regulation.

Insurance companies which would benefit from insurance guarantee funds could elude the prudential rules and be encouraged to cover risks which would not have been normally covered in traditional market schemes.

The issue of a **possible anti-selection of risk** must also be considered. If insurance companies were to distribute such a solution in the name of the European Guarantee Fund, they may find it more difficult to refuse to insure some market operators, considered as "too risky" and/or to apply risk control and prevention measures. This is why this solution might have an adverse effect on insurance companies' risk selection and market regulation practices.

Such a situation might lead to the **development of rather unreliable building operators or to the implementation of solutions or technologies that are unsatisfactory in terms of quality.**

- As emphasised here above, one of the major problems that prevents insurance companies from covering certain types of construction products or processes, in particular concerning innovative technologies, is the **lack of statistical data** and of feedback of experience required to assess risks effectively and to define the price thereof. Even if the Insurance Guarantee Fund provided the additional financial capacity to the insurance sector to cover "innovation" risks, this might not necessarily contribute to remedying this principal difficulty with which insurance companies are confronted.

- It was proposed that this solution would only be accessible to building companies which meet specific criteria as regards their size and the type of activities they are involved in. This could lead to **market discrimination** and provide an "artificial" competitive advantage for certain market operators, thereby discouraging the development of activities, which would not come within the scope of the criteria defined by the pilot project. In this context, the solution may be found to be incompatible with Article 81 of the Treaty which establishes the European Community[52].

[52] Article 81 of the Treaty establishing the European Community prohibits initiatives which could result in the restriction or distortion of competition within the common market:

- Beyond the fundamental constraints outlined above, the question concerning the **operating modes of this fund** should be asked. Firstly how would the relevance of the amount allocated by the European Parliament be ensured without a previous analysis of the real needs of construction firms and insurance companies? Secondly, which European organisation would have the resources and competence to manage the thereby allocated amounts? Lastly, what would be the efficiency measurement tools for this initiative in terms of accessing insurance, encouraging the development of eco-innovation solutions and improving consumer protection?

When taking account of the problems emphasised in this report, it appears that the construction and insurance sectors are interested in solutions which would improve long-term market conditions, leading to a balanced development of the sustainable construction activity and to the creation of a competitive market for "innovative insurance".

By definition, the European Guarantee Fund solution is intended to be a **short-term measure.** Actually, the solution referred to intends to provide additional financial capacity to the insurance sector for the purpose of encouraging it to adapt more easily to certain types of construction risks. However, as shown here above, the main problem is not the lack of insurance capacity within the said sector, but the lack of relevant risk assessment and prevention tools, which would enable the insurance sector to adequately asses such risks and to ensure that the risk is maintained at an acceptable level.

The solution would probably act in favour of access craft and small firms to insurance, but there is a danger that it may have adverse effects in terms of market competition and, if it is implemented without appropriate risk assessment or prevention methods, in terms of the quality of services offered by construction market operators, resulting in reduced consumer confidence in sustainable and innovative technologies.

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1. The following shall be prohibited as incompatible with the common market: all agreements between undertakings, decisions by associations of undertakings and concerted practices which may affect trade between Member States and which have as their object or effect the prevention, restriction or distortion of competition within the common market, and in particular those which;

(a) directly or indirectly fix purchase or selling prices or any other trading conditions;
(b) limit or control production, markets, technical development, or investment;
(c) share markets or sources of supply;
(d) apply dissimilar conditions to equivalent transactions with other trading parties, thereby placing them at a competitive disadvantage.

2. Any agreements or decisions prohibited pursuant to this article shall be automatically void.

3. The provisions of paragraph 1 may, however, be declared inapplicable in the case of:

- *any agreement or category of agreements between undertakings;*
- *any decision or category of decisions by associations of undertakings;*
- *any concerted practice or category of concerted practices*

which contributes to improving the production or distribution of goods or to promoting technical or economic progress, while allowing consumers a fair share of the resulting benefit, and which does not impose on the undertakings concerned restrictions which are not indispensable to the attainment of these objectives.

Lastly, certain stakeholders have raised the question, whether the current context of growing synergies between banking and insurance organisations known as bancassurance could possibly contribute to creating more favourable conditions for implementing the proposed solution of insurance guarantee fund in the short term. It needs to be highlighted that currently the phenomenon of bancassurance concerns in particular personal banking sector and insurances dedicated to individuals rather than the field of corporate banking and commercial insurance. Moreover, even if further developments of bancassurance lead to an expansion of its scope towards business sector, it is important to remember that the financial organisations involved in providing insurance services would be operating within the same conditions and constraints as classical insurance companies in respect of legal and regulatory requirements, rules of risk assessment and selection, access to financing, availability of reinsurance and etc. Therefore it seems unlikely that the development of bancassurance could significantly change the situation described above in terms of feasibility of the insurance guarantee fund in the short term.

BENEFITS	DRAWBACKS
- Utilisation of feedback of experience from the successful EIB and EIF contribution as regards access to credit; - Short implementation time frame as an answer to a cyclical difficulty; - Specific response to similar needs expressed by small and craft construction firms for insurance coverage connected to the development of eco-technologies;	- Lack of operating similarities between banking and insurance institutions in terms of risk analysis and assessment, technical reserves and reinsurance; - Difficulties linked to setting up consistent and uniform access criteria to the guarantee fund; - Discrimination according to the development level of national construction insurance solutions; - Risk of encouraging development of rather unreliable operators and of implementation of eco-technologies, which are of unsatisfactory quality and not controlled; - Lack of statistical data and experience feedback enabling risk assessment and definition of the price thereof; - Different approach adopted depending on technologies developed. - Operational constraints: relevance and sufficiency of allocated amounts, inexistence of a European body capable of managing this fund, assessment tools, short-term outlook, etc.

7.3. Harmonisation of liability and insurance regimes

Historical background

As we have outlined in the previous sections of this document, the possibility of a harmonisation of liability and insurance systems in European Union Member States was analysed during the 1990s.

At the time, the European Parliament indeed considered that "*the distortions, which result in particular from the disparity of regulations concerning insurance for example, should be eliminated."* With this understanding, it requested that the Commission "*recommend to Member States that they ensure improved* ***legal and technical protection for consumers*** *and insist that they harmonise the standards which govern after-sale housing guarantees."*

In reply, the European Commission considered that it would be desirable, in order to facilitate exchanges within the Single Market, to harmonise rules on constructors' liabilities and guarantees and therefore to prepare a directive.

Further to a first study requested thereby and undertaken by Claude Mathurin (study of liabilities, guarantees and insurance for the purpose of harmonisation at Community level), this is the spirit in which the Commission set up four working groups made up of approximately fifty experts who composed the Group of European Inter-Professional Building Associations (*GAIPEC*), belonging to the relevant European professional organisations and the work of which was to serve as basis for the preparation of a draft directive.

The *GAIPEC* group's analysis, of which the final report was completed in 1992, focused in particular on works' acceptance procedures, liabilities, insurance and financial guarantees. *GAIPEC's* work did not lead to concrete measures in view of major differences in opinions regarding the scope of application of a possible directive. The failure of this harmonisation project gave root to the idea of an insurmountable diversity of national legislations in Europe and, therefore impossible convergence between the Member States.

Current situation

According to the specifications of the call for tender launched by the Commission, our study does not include an examination of the conditions for a possible harmonisation of liability and insurance systems on a European scale. Nevertheless, it should result in an inventory of the national regimes within the European Union, the liability insurance obligations of building sector participants in view of the European Internal Market target for services, and their impact on the quality of constructed buildings, innovation, sustainable development, and consumer protection.

Despite the past experiences, we believe that the idea of harmonisation may still be topical, as it was already the case in the 1990s.

Firstly, it would obviously facilitate cross-border construction activities, especially for small and craft firms, which, due in particular to their size, organisational capacity and financial resources, still do not dispose of adequate means to access the legal information required within their activities as well as the appropriate insurance solutions.

Secondly, it might be beneficial for all consumers, insofar as this would enable them to understand the minimum protection levels more easily and therefore have the possibility of impacting its evolution.

Lastly, harmonisation of liability and insurance systems would have the advantage of facilitating, at a European level, joint initiatives in the fields such as risk assessment, quality promotion and creation of insurance schemes adapted to new environmental technologies, and therefore development and wider dissemination throughout Europe.

Obstacles

Nevertheless, certainly the need for harmonisation is not perceived and acknowledged by everybody in the same manner. Some parties concerned would like to see an enforcement of an extensive reform, reflecting their own national law and experience, assuming that this would constitute the support for the increased protection of consumers and an efficient public prevention policy conducted at a European level. On the contrary, others parties may fear that harmonisation could result in mitigating certain national regimes under the pretext of simplifying complex legal approaches and the elimination of competition distortion factors.

The immediate question is to ascertain what would be the scope of a European policy in this field? Would it lay down a new and restrictive legal system for all Member States? Or would it consist in minimum provisions that each Member State would fulfil according to its internal degree of protection?

Furthermore, the *GAIPEC* approach was considered as unrealistic at the time when the European Community comprised only 12 States. Today, with 27 Members, and probably more in the near future; the situation appears even more complex in view of the great disparity of cultures, practices and traditions, but also the different levels of economic development throughout Europe.

Also, the administrative burden and costs resulting from the replacement process of existing systems in the EU Member States by a uniform regime must not be under-estimated. Such an in-depth and complex legislative initiative would imply a lengthy implementation period before the advantages become visible.

In addition to the above, there is a risk that the “unified” system, imposed for the entire European Union, neglects local specificities linked to technologies used, quality control, customs, building standards, climatic and geographic constraints, etc., leading to confusion and a possible reduction in the building sector’s efficiency and quality. In fact, some local conditions convey different solutions from one country to another and therefore adaptation of construction products and proceedings is necessary in order to suit specific climatic conditions or requirements of each market. For example, the temperate

climatic conditions in France have encouraged the development of masonry walls with a single render coat on the outside and a lining on the inside; damp conditions in the United Kingdom led to the cavity wall; continental conditions in Germany to external insulation; render, windows, etc..

Common issues

In spite of all these well-known national diversities which are often recalled when the issue of European harmonisation is at stake, our analysis of liability and insurance regimes does however indicate that protection requirements are expressed in numerous countries in a fairly uniform manner. Accordingly, the analysis of national systems indicates that a lot of countries have considered or set up measures and tools for the purpose of satisfying the safety and protection needs of real estate buyers.

In this field, in the very large majority of European Member States, there is legislation specific to constructors reinforcing their liability with a view to protecting property buyers and, in many cases, mandatory insurance and guarantees covering post-completion construction risks. In other words, it is possible to highlight convergence points which are:

- 10 years duration of cover;
- insurance of construction works referring in particular to housing;
- scope of insurance covering in particular stability and structural defects and, in some cases extended to defects affecting utility or fitness for purpose of the building and its equipment;

We can also say that the insurance solutions in place in various Member States are, in many cases, independent from the national liability framework, as the duration of the guarantee tends sometimes to be “disconnected” from liability terms specified by law.

The reason of the above is due perhaps to the fact that the duration of insurance cover is influenced by technical expertise (10 years is considered as a sufficient “testing period” for the building’s solidity) and, today above all, it appears to constitute a balanced compromise between buyer’s protection and insurance market constraints.

As we can see, it would appear that the diversity of insurance and liability systems does not prevent the adoption of similar solutions in Member States having quite different practices, legal frameworks and traditions.

This is why we can consider that implementation of flexible solutions intended to ensure an equivalent level of building standards as regards to sustainability, consumer protection and energy savings is possible, in spite of the diversity of existing insurance and liability systems.

BENEFITS	DRAWBACKS
- Potential way to facilitate cross-border activities, especially for small and craft firms; - Simplified access to the European construction insurance market; - Proposed protection levels and guarantees potentially easier to understand for consumers; - Facilitator of joint initiatives in the fields of risk assessment, quality promotion and creation of insurance schemes adapted to environmental technologies;	- Strong differences of Member States' appreciation of the required harmonisation level, due to their domestic law and experience; - Lack of clarity about the nature and scope of a European policy (restrictive character, minimum provisions, applicability over time, etc.); - Complexity due to the significant and increasing number of Member States (difference in cultures, practices, traditions, protection levels, etc.); - Administrative burden and resulting costs related to the replacement process of current national systems; - Potential lack of consideration of local specificities related to traditional building rules, building standards, geographic and climatic constraints;

7.4. A European insurance standard contract

While it is broadly acknowledged that the construction market is now fully integrated in a European economic context, especially through the free provision of services on cross-border basis, it must also be admitted that the absence of common rules or the rules development that are not too restrictive, especially with regard to guarantee and insurance, constitutes a barrier for the development of a real internal market in this field.

For this reason and in the absence of prospects for harmonisation of liability and insurance systems in the short or medium term, there is now a growing interest in identifying alternative practical solutions to meet the needs, which are common to the whole European market and to achieve similar results throughout Europe despite the diversity of national regimes

One of the possible ways that might answer this growing need to support the development of construction services in Europe could consist in the implementation of standard construction insurance contract. This would constitute a European passport for small and craft firms wishing to develop cross-border activities.

This initiative would have the additional merit of being in line with the regulation No. 593/2008 of 17 Jun 2008 on the law applicable to contractual obligations (Rome I).

Indeed, and quite unlike the Rome Convention of 19 June 1980, this regulation includes insurance contracts in its scope of application and, furthermore, admits, in point 13 of its preamble, the possibility for the parties to incorporate a non-state legal system.

Without wishing to obliterate in any way the existing national construction insurance regimes which are well developed in certain Member States, this solution by agreement could be used voluntarily by the parties if the recipient of the service expressly and manifestly so desires.

Within these conditions, the contract would then take precedence over national legislations or market rules regarding insurance, although these would remain obligatory in the cases where the parties had not opted for the "European insurance contract". The implementation of this solution could be considered in the event of cross-border business and for work related to sustainable technologies. In this respect, work falling within the field of the Energy Performance of Buildings Directive (Directive No. 2002/91/EC of 16 December 2002) could be targeted. Indeed, the latter would have the advantage of specifying a common European method of calculating the energy performance and of imposing minimum thresholds in respect of energy performance for new builds and renovations as well as establishing certification of buildings on these characteristics.

While the scope of an initiative that could give rise to the implementation of a European insurance solution could be envisaged at first place as limited to cover sustainable development only, it would remain essential to its success and development that all interested parties (public/private project owners, contractors, insurers etc.), represented by their Federations at the European level, came to agreement and defined the main principles of the latter.

Once the principal characteristics of this contract are defined, it would be at the discretion of the Commission to judge whether it is appropriate to proceed to its application by way of recommendations in all Member States, with a view to conferring on this consensual European model an official character, once, of course, the parties had agreed to be subject to it.

In our view, this European insurance scheme would have to meet the following essential requirements:

- access open to any contractor normally resident in the European Union and executing construction works in the context of the free provision of services,
- applicable to all construction works, including renovation work, aimed at improving the energy performance of a building in the sense of and in accordance with the provisions of Directive No. 2002/91/EC,
- cover of personal and material damages suffered in the course of the works by the recipient of the services and third parties,
- cover of the risk of financial and/or technical failure of the contractor in the course of construction,

- cover of hidden or latent defects discovered after completion of the works,

The duration of this guarantee should be defined according to the existing requirements in the Member States where a building insurance solution has already been developed (see chapter 6). Considering, however, that the duration of cover of ten years is not uncommon in our modern societies, it should constitute, in our opinion, the means of contributing to the goal of protection of the European citizen.

Assuming a 10 years cover, it would be interesting consider also an inspection of the works by an independent organisation. This inspection, performed for example 5 years following completion, half-way through the period of cover would help to reveal any potential inappropriate maintenance or use problems, as experience shows that, particularly with regard to insulation, many claims are due to this type of problems, which constitute an aggravating factor in the incidence of claims. It would be then the responsibility of the owner to carry out the necessary maintenance, without which his guarantee could be refused or at least limited in its amount.

- use of construction products and processes covered by a harmonised European standard or European technical approval. The implementation rules would remain within the regulatory competence of each Member State,

- involvement of an independent and specialised inspection organisations (technical inspector, consulting engineer, technical design office etc.) in charge for prevention of risks in the course of construction and verifying upon completion of the works that the contractually defined energy performance is achieved.

Although the idea of European insurance contract seems attractive, it should not be neglected that at this stage, implementation of such a solution would be affected by difficulties connected with the diversity of liability systems of the Member States and of their building regulations. As we have demonstrated above, insurance schemes are developed within a wider context related in particular to administrative rules, construction requirements, the respective roles and responsibilities of each party involved, the quality signs and labels, the methods of risk assessment and prevention.

By the way, such an insurance scheme may also be affected by some market customs and practices related to purchase of real estate and resulting in certain expectation of consumers (for example the cover granted by NHBC in the UK is closely related to construction operation of dwellings in the sense that it is a condition for obtaining the mortgage from credit institutions, in some countries certificate of cover is subject to verification by the notary in the framework of purchase transaction...).

Finally, such an approach would present a disadvantage of being a potential source of distortion of competition between national and supra-national construction activities, particularly in the Member States where the level of protection required is high and thus constitutes a cost, sometimes non-negligible, for the small and craft construction firms.

As a consequence, it seems necessary in first place to quickly implement tools to provide the interested parties with all the useful information and data regarding quality labels, risk assessment methods and building deficiencies in order. The above could in parallel encourage the deployment of insurance schemes contributing to the promotion of innovation and of sustainable development in the field of construction.

BENEFITS	DRAWBACKS
- Does not require harmonisation of the national insurance systems. - Initiative in the spirit of European rules governing contractual obligations (Rome I Regulations). - Specific response to cross-border activities and the question of sustainable development in the construction industry. - Long-term guarantees, adapted to the needs of SMEs and project owners. - Possibility of establishing risk prevention and control measures. - Speed of implementation.	- Necessity of reaching agreement on the scope and working methods of the guarantees. - Challenging the traditional national links between liability and insurances. - Difficulties of implementation connected with the highly diverse administrative and technical rules of construction. - Challenging of national habits corresponding to the expectations of the project owner and society (Condition for obtaining a loan, transfer of ownership, legal deeds etc.). - Distortion of competition between intra and supra-national activities.

7.5. Involvement of the insurance sector – charter

In the progress report produced in the context of this study, the ELIOS team have developed a proposition of voluntary charter which could be signed by insurers interested in promoting sustainable development in the construction industry. One of the ideas related to the charter was the proposal of creation of official bodies under the auspices of the European Commission, within which concrete initiatives could be undertaken in the fields of prevention measures, quality improvement reflection on implementation of insurance schemes.

The aim of this charter was to promote initiatives designed to resolve the concerns identified: access of small and craft firms to the insurance market, identification of insurance schemes and good practices which could help , in particular small and craft firms, to explore innovative sustainable construction solutions, adopt responsible management practices and promote among owners and constructors the development of risk prevention measures prior to and during construction work as well as the practice of effective after-sales services following the completion of works.

Following the submission and presentation of the interim report, more detailed discussions were held will the members of the Monitoring and Steering Group. During these, the CEA (European Insurance and

Reinsurance Federation) expressed its intention not to sign the charter proposed by the Elios consortium.

The insurers justified this decision by their involvement in undertakings aiming to promote sustainable development on a larger scale, such as UN environmental programme, Corporate Social Responsibility or the European Committee on Climate Change.

Moreover, we share the idea expressed by certain stakeholders that such a unilateral undertaking by the insurers might not be effective in developing sustainable construction, as it would rather require a close co-operation between various parties concerned in order to improve skills of those involved in implementation of the new construction techniques, which would result, as a consequence, in a better "insurability" of these risks.

Although the idea of a commitment by the insurers through a charter has been abandoned, the principle of creating two bodies, initially intended as vehicles for implementing the charter, has been retained because the stakeholders expressed an interest in developing a mechanism, which could help the insurance and construction sectors to adapt to sustainable development.

7.6. European bodies

At the stage of progress report the ELIOS team suggested creation of two bodies, the roles and functioning of which are presented in the part 7.6.1. Following different exchanges with the stakeholders, and in particulars those from the ELIOS Workshop of 18 March 2010, the ELIOS team considered the opportunity of creating a single body instead of two separate entities with closely interrelated missions. It was considered that the mission of a single body would be more coherent and it would reduce potential coordination difficulties. The proposition of the single body is outlined in the part 7.6.2.

7.6.1. Initial proposal

As we have outlined above, solutions involving European harmonisation of the liability and insurance regimes and implementing of a European standard insurance contract appear difficult to envisage in the short or medium term. In fact, it is difficult to impose such major changes of rules, which are very often the result of different national historical and cultural contexts. Nevertheless, it seems necessary to encourage a progressive evolution towards common solutions. The emergence of common schemes may gradually encourage the legislation to be brought closer into line on a reciprocal basis.

In order, therefore, to favour creation of conditions necessary for development of insurance schemes encouraging innovation and sustainable construction in Europe, it seems preferable to us to favour a voluntary approach such as the European standard contract[53].

In this light, and bearing in mind the practices and experience at national and European levels, we are in favour of a consensual route consisting in creation organisations, which would act as genuine forums for exchange and collaboration among the construction market stakeholders.

Support on the part of the European institutions would however be essential for this consensual arrangement to be effective and able to propose concrete actions.

This alternative solution should meet the following objectives:

- Be able to develop solutions which can be adapted flexibly to the different EU insurance and liability frameworks, with the goal of achieving equivalent results in terms of quality, sustainability, consumer protection and energy saving;
- Be able to work in a long-term perspective and to adapt the proposed solutions to the needs of the constantly evolving construction market;
- Be able to support the development of risk assessment and preventive measures and to disseminate the related information;

The first body proposed, known as the Co-operation Committee, would comprise a task force made up of representatives from the construction and insurance sectors, devoted to developing solutions which would help to reduce national and cross-border barriers, which impede the development of sustainable construction. Among the areas to be considered, that of the convergence of national regulations appears paramount.

The second body, known as the Technical Agency, would be intended to become an independent scientific institution devoted to collecting, analysing and providing to members of the insurance and construction sectors information relating to the implementation of sustainable and innovative technology in the construction industry in Europe and in particular information relating to defects occurring and the losses resulting there from.

Based on the example of the CEIOPS (Committee of European Insurance and Occupational Pensions Supervisors) and the EIOPC (European Insurance and Occupational Pensions Committee), two consultative committees set up in 2003 by the European Commission to support and advise the Commission on questions relating to the reinsurance, insurance and occupational pensions market, it was considered that specialist committees devoted to facilitating communication between the insurance

[53] Comité Economique et Social Européen 1626/2004 du 15 décembre 2004 (INT/202) ; « Un droit européen des contrats plus cohérent- un plan d'action » (COM(2003) 68 – 2003/2093(INI)), JOUE du 02 septembre 2003.

and the construction sectors and to advising the Commission on sustainable development policies in the construction industry could help to solve the problems identified earlier in this document.

The benefit of establishing two bodies derives from the idea that the Co-operation Committee would be a preferential contact for the European Commission on matters of liability and insurance in the construction industry and would act to achieve greater cohesion between the Members States of the European Union in this field. While the Technical Agency would be devoted to conducting objective and scientific analyses relating to quality and defects in the construction industry with the aim of making this information readily accessible to stakeholders in the market.

Even if, at this stage, the ELIOS team is of the opinion that the roles of the two bodies are different and should, therefore, be filled by two independent organisations, we do not exclude the possibility of creating a single body designed to fulfil the two roles. This question should be the subject of more detailed consultation with the stakeholders in the market.

Moreover, certain tasks assigned to these bodies should be fulfilled in close co-operation with existing European associations or institutions:

- The European Construction Technology Platform (ECTP), a technology platform whose role is to develop a strategic vision for research and development in the construction sector in Europe;
- The European Organisation for Technical Approvals (EOTA), responsible for drawing up common rules of procedure for the submission of applications and the preparation and granting of European Technical Approvals (ETAs);
- The European Union of Agrément in the Construction Industry (UEATC), whose role in particular is to co-ordinate research and the exchange of technical know-how within Europe;

A very general description of the proposed bodies was given in the interim report. At this stage, we intend to provide a more detailed proposal with respect to the solution relating to the missions and the activities of these bodies as well as a cost-benefit analysis of establishing them.

Figure 17 - Roles of ELIOS CC and ELIOS TA

ELIOS CC	ELIOS TA
Forum for exchange and collaboration with a view to collecting and disseminating information on the existing systems, promoting solutions and co-ordinating joint initiatives; - Encourage convergence in the development of national regimes (towards a European model?); - Co-ordinate initiatives enhancing freedom of services provision (single points of contact as specified in Article 21 of the Services Directive); - Develop and implement on a European level insurance regimes favourable to sustainable development, to access for small businesses to construction contracts or to a satisfactory quality assessment;	Technical body responsible for assessing and investigating defects, promoting quality and facilitating creation of insurance solutions for eco-technologies at a European level; - Facilitate a common understanding of the respective technical requirements in the Member States; - Compile and disseminate information available from defect investigations; - Encourage the co-ordination of technical approaches; - Assess the impact of sustainable development in terms of availability of adequate insurance cover;

a. ELIOS Cooperation Committee

The objective of the proposed co-operation committee would be to become the preferred point of contact in Europe for public and private sector stakeholders in the construction and insurance industries. It would act as a task force, a real forum for thought, consultation and the development of proposals, under the auspices of the European Commission, with the role of conceiving and promoting all actions intended to support, secure and guarantee innovation and eco-technologies.

Once established, this interdisciplinary body will have to consider what measures should been taken as a priority in order to encourage the creation and development of insurance systems in support of sustainable construction in Europe.

Under the principle of subsidiarity, the European Union may only intervene when it appears neither possible nor desirable to rely solely to national or regional provisions.

This same principle must clearly govern the deliberations and actions of this committee which will not be able to interfere in problems at a national level or in problems within the competence of national authorities. But it must moreover exercise caution in every step it takes. Within the actions undertaken legal, cultural and historical context of each Member State must be respected.

Rather, it should contribute to creation of favourable conditions taking into account the objectives followed and experiences from solutions implemented in the Member States, which have already put in place insurance schemes or which envisage to do so.

I. Objectives

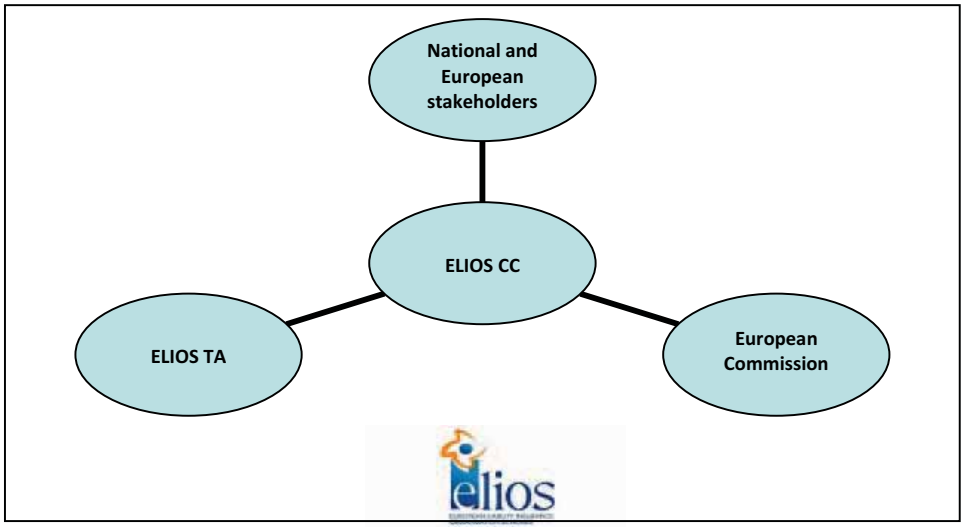
The main goals of this body could be defined as referring to:

- **Need for national convergence**: To offer a common definition of the criteria which construction insurance regimes must meet, by promoting national convergence in order to limit the growing diversity of national systems;
- **Access to information**: To support European and cross-border activities by facilitating access to information for services providers and to the insurance solutions necessary for their operations. The absence of common perception and identification of existing insurance solutions across Europe is quite regrettable, especially when a Member State considers establishing a construction insurance regime in its territory;
- **Promotion of insurance regimes**: To analyse, if required, propositions of model insurance schemes specifically meeting the needs most frequently expressed by constructors;
- These studies could by the way be conducted on propositions defined elsewhere, such as the possible establishment of a guarantee fund or of a European model insurance contract;

II. Composition

This committee, chaired by an independent person appointed by the European Commission, would comprise on the one hand of a representative from the ELIOS Technical Agency and on the other hand members representing stakeholders in the construction and insurance market, appointed by their respective professional organisations.

Figure 17 - Interaction of ELIOS CC and ELIOS TA with the market stakeholders and the Commission



III. Activities

The activities which could be assigned to the ELIOS CC committee include:

- Collaborating with the European Commission on developing a European vision for 2020, establishing a strategic agenda for research, roadmaps for the development of insurance regimes in support of sustainable construction in Europe;
- Becoming a preferred point of contact for national authorities interested in introducing changes to their insurance and liability regimes and seeking information on the solutions existing in other Member States;
- Drawing the attention of European and national political bodies to the problems relating to construction risks identified by the Technical Agency and promoting co-ordinated initiatives to resolve these;
- Formulating recommendations and opinions on policy measures relating to construction and construction insurance;
- Following regulatory developments and national policies relating to liability and insurance in the construction sector and making this information accessible to all stakeholders via an internet portal;
- Identifying the insurance regimes and best practices to be encouraged in view of supporting innovative solutions for sustainable development, adopting a responsible management approach and ensuring appropriate assessment of risks, including construction monitoring measures;
- Identifying obstacles to the cross-border provision of services (formalities and procedures required for access to construction work, in particular the declarations, notification or applications required), and to the diffusion of innovative, sustainable technologies across Europe (national innovation risk assessment criteria);
- Promoting measures of technical deficiencies prevention amongst construction sector stakeholders before and during the construction process as well as effective post-completion customer service after handover, supporting actions aiming to bring cohesion among Member States in this area.

b. Elios Technical Agency

For many decades now, Europe has been committed to quality in building construction, as would be implied by the direction taken in the White Paper on the achievement of the internal market (targeting

the reliability and durability of structures) and as apparent from the numerous European documents adopted since (directives on building products, the energy performance of buildings, etc.).

With respect to this aim, there is, however, no technical body at the European level responsible for construction pathology and for promoting construction quality. Moreover, there are few examples of such bodies operating at national level, such as Agence Qualité de Construction in France or the Danish Building Defects Fund in Denmark.

Because information on construction pathology, on the prevention of recurring damage and on good practices is not centralised and widely disseminated, it is not easily accessible to players in the market and in particular to small and craft firms in the different countries.

This situation contributes to the difficulties the insurance sector has in evaluating the risk associated with innovation. The absence of relevant scientific data is impeding the development of insurance cover for certain types of risk.

It is clear that the construction sector and the insurance sector need reliable technical information which could support appropriate risk assessment and the development of preventive tools within the insurance industry and help the construction sector to accelerate the development of innovation and enable it to learn more quickly from past experience.

The members of the CEA (European Insurance and Reinsurance Federation) recognise that the availability of such technical information could help to create a real competitive market in the cover of innovative construction techniques.

In addition, the insurers represented by the CEA declare that for the insurance sector the advantages of the technical data may be even larger. Indeed, this may also be useful in other areas of insurance, such as fire risks, the risks of damage to property or health and safety risks.

It could be said that, in the case of conventional construction, it is possible to insure the majority of risks and they are generally insured, including the guarantee of performance (fitness for purpose).

Problems arise, however, in the case of innovative or sustainable construction technology, owing the lack of feedback of experience on such technology. It is currently difficult to obtain cover for the performance guarantee.

The general nature of the subject, which covers a multiplicity of related questions, and also the enormous complexity in the approach to risk and its very rapid evolution, justify the creation of a permanent European forum open to all stakeholders from Member States and existing European institutions. As well as symbolising the concept of quality in building construction, this forum would also facilitate the circulation of and access to information and would help the partners to find their way through the great number of regulations, methods of risk assessment and quality marks across Europe.

We believe that this could be the general role of the European Technical Agency. The main missions and functions of this body are outlined in the following paragraphs.

1.1. Objectives

The promotion of quality in construction in Europe, symbolised by the Agency, requires, as we believe, two key actions. On the one hand, the active prevention of problems, in which assessment and technical control are essential factors, and on the other hand transformation of approach of construction by opening it up to the concept of sustainable development.

Construction quality must be ensured by:

- Collection and diffusion to the stakeholders of data on building defects;
- Active prevention resulting from knowledge of building pathology;
- Encouragement to establish European technical norms, particularly with respect to environmental technologies;
- Promotion of risk assessment and control measures by specialist bodies.

The proposed European Agency for the promotion of quality in construction should constitute a necessary tool in achieving the successful development of innovative solutions in Europe in the field of renewable energies in the construction sector:

- By collecting, processing and providing a database on the construction defects which would make it possible to achieve an understanding of building pathology at the European level. Without such data it would not be possible to avoid the recurrence of certain damages or to prevent the use high risk products, etc.
  This knowledge of building pathology, which requires in particular a careful monitoring of defects, is essential if progress is to be made in the matter of quality and in improvement of skills of all those involved in the construction process. It also constitutes an indispensable risk assessment tool for the insurers.
  The creation of this body would facilitate the exchange of information on innovation in the construction sector and would offer greater protection to the end users of the buildings.
  The Agency would not simply be responsible for collecting information, but above all would have to diffuse it in a form easily understood by the various stakeholders involved.
  Generally speaking, the Agency should aim to identify the actions required to transform the intentions in terms of construction quality into reality through encouragement of initiatives aiming in prevention of risk and in promoting quality labels.
- By becoming a platform for the exchange of information on the existing situation (climatic/environmental, regulatory approach, etc.) and the techno-economic solutions preferred in the various countries: indeed, as stated above, such conditions are the vehicle

for different solutions in different countries and for the adaptation required from construction products or processes. It is also clear that regulatory developments can change the situation: development of external insulation in France, etc.

- By initiating or at least steering/supporting projects: identification of priority subjects for European «DTU standards» or for technical assessment guides or technical recommendations.

- By helping to establish a common European nomenclature of construction terms associated in particular with eco-technologies, in order to facilitate the Europe-wide exchange of good practice and of information relating to the construction industry.

2.1. Composition

In order to ensure efficient data collection and monitoring of construction quality in the long term, the Agency should have a permanent organisation responsible for the body's day-to-day activities. The employees of the permanent organisation would have a high level of professional competence in the construction sector. It may also involve independent bodies to conduct ad hoc scientific and technical studies.

In addition, invitations to participate in the Agency's deliberations and work, through the consultative committee would be extended to representatives from European professional organisations representing all the stakeholders in the construction sector, including final clients, technical monitoring authorities, insurers and scientific organisations, such as research centres or technical institutes and other specialist construction technology bodies and European organisations with a recognised technical role (EOTA, ECTP, etc.).

It is also desirable for the Agency to have connections at national level to enable a better understanding of local systems and also to ensure consistency in the transfer of data collected locally in each country to the common European Union database. To achieve this, each Member State may be asked to nominate one or more bodies already carrying out such work, or to establish them.

3.1. Activities

<u>Data collection</u>

It is generally recognised that the collection of data from insurance companies could be a potentially sensitive issue. The Agency must therefore find ways to produce data which is scientifically neutral so that insurance companies and other parties can contribute without compromising their interests.

It is important to make sure that the data collected is not too general or too specific to be used by the insurance companies and other stakeholders in the market.

Data should be collected by the Technical Agency or its representatives with the aim of improving the quality of construction, preventing construction problems and providing a better understanding of the

risks associated with the use of innovative construction technology. It will also be used to help insurance companies to appreciate demands for compensation and their cost in more detail.

The data collected would mainly contain information about:

- incidents reported,
- an analysis of cause of incidents,
- remedial solutions,
- the effects of the incident in terms of damages and consequential losses.

Considering the problem of a lack of data about innovative technology, the Technical Agency will pay particular attention to solutions relating to sustainable development and innovation in construction. The Agency could foresee the development of specific intelligence systems or tools dedicated to assessing the use of innovative and sustainable technology in construction, including efficiency and the real overall cost of innovation, including costs such as maintenance and repair.

Notes on the national qualification and certification bodies

The Agency would be able to examine directly, or via local representatives, the national certification and qualification bodies for construction and deliver a view on the reliability of their procedures and the labels and certification provided.

Furthermore, the Agency would be able to stimulate the exchange of expertise and best practices between the certification and qualification bodies from different Member States and encourage greater consistency between the procedures and assessment criteria used by the bodies.

Who will collect the data, and how?

The data can be provided to the Agency or its representatives by stakeholders, in particular by insurance companies and public or private technical inspectors appointed to investigate incidents. The most practical methods for collecting data should be defined for each national system to guarantee consistency and avoid situations where incidents are not reported or where the same incidents are reported by different bodies.

To guarantee the consistency of the data provided the Agency must decide on a standardised format, in which the data must be submitted. The Agency can create an electronic system, or other appropriate dedicated tools for data collection and processing.

The Agency may also seek information via other channels such as surveys or studies released to the general public, as well as interviews, expert opinions and co-operation with organisations specialising in different areas such as governments, professional bodies and scientific institutions.

Informing the public:

The Agency will handle the data collected to produce reports intended to keep the public informed about issues relating to construction quality, and in particular:

- the reason for common defects;
- the cost of damages;
- the guidelines intended to avoid problems;
- the approach of each member state to construction quality, for example the way quality is assessed and the way quality requirements are enforced in different countries;
- the effects of different European and national policies on the development of construction quality;
- experiences linked to implementing sustainable and innovative construction technology;
- guidelines for stakeholders in construction who are interested in developing their cross-border activities.

Compliance of the Technical Agency's activities with existing European initiatives and policies

The Agency could be very useful within the framework of the policy of the Lead Market Initiative, aiming to create the market conditions stimulating the development of sustainable construction in Europe.

The results of the Agency's activities may benefit the insurance and construction sectors in particular and the public in general by increasing overall understanding of the risks related to construction technology.

The additional advantage of creating such an organisation on a European level is that the stakeholders from the EU market would have access to information about the construction experiences and risks encountered in other Member States which is currently not easily accessible, especially for small businesses.

The Agency should also act as a source of support and a scientific consultant for the ELIOS Cooperation Committee described above.

Furthermore, the Agency's activity could provide a valuable support for the activities of other European organisations as well as scientific support and expertise which could contribute to the decision-making process on a national and European level on questions relating to:

- ✓ construction products and services;
- ✓ construction insurance;
- ✓ innovative technology;
- ✓ sustainable development
- ✓ qualification and certification policy relating to the construction sector;
- ✓ construction activities on a cross-border basis.

The existing organisations which might specifically benefit from the information provided by the Technical Agency are, for example:

- ✓ the European Commission;
- ✓ national governments;
- ✓ the European Construction Platform;
- ✓ the European Technology Action Plan;

FINAL POINTS

As an intended European public interest organisation, it is important that the Technical Agency is strictly neutral and independent in relation all parties involved in construction activities. The absence of political or financial pressure is essential for this organisation to pursue its technical and scientific projects and constitutes a guarantee of the objectivity and credibility of its activities.

With this in mind, it seems appropriate to imagine that the Technical Agency would benefit from a financial contribution from the European Commission within the context of its policy to develop the lead markets in Europe.

It is also possible that the organisation is be partially funded by contributions from its members.

The proposed solution of a Technical Agency and of Cooperation Committee would not contribute to any restriction or discrimination of free economic activities within the internal market.

In fact, the Cooperation Committee, as a multi-disciplinary and international body, would not represent the interests of a limited group of stakeholders in the market, but would rather form a platform for information and exchange which would contribute to the interests of all stakeholders, through which all the parties involved in the market would be able to express their opinions and concerns.

Moreover, by providing specialist information and contributing to a better understanding of the functioning of the European market of construction services and of construction insurance, this solution might help to stimulate the market competition, market integration in terms of cross-border activities and to increase of the choice available both on the construction and insurance market.

It is understood that the body itself would not have any political or decision-making power; however it would act as a support and advisory body to the European Commission in the matters related to construction risks and construction insurance.

Therefore the body would not have any power to impose restrictions or obligations on the market or on specific market actors, however the information provided by or conclusions reached as a result of the deliberations of this body relative in particular to important problems identified might contribute to encourage the adoption of such decisions by other bodies having an appropriate mandate on European or national level.

7.6.2. Final proposal

The results of the ELIOS research and the recommended solutions were discussed by the ELIOS team with the Commission and the Panel of Stakeholders during a Workshop on 18th March 2010.

The Stakeholders present at the Workshop have acknowledged the following existing needs identified by the ELIOS research:

- to facilitate access to objective, complete and up to date information on national construction liability and insurance regimes to the authorities of the Member States, European authorities and other parties concerned;

- to facilitate cross-border activities of construction firms and to reduce existing barriers related to access to insurance for construction parties;

- to provide practical measures dedicated to reduce the existing gap between the necessity to accelerate innovation in construction and the need to provide appropriate security and guarantees for clients and users of buildings;

- to enhance mutual recognition of quality signs and indicators such as quality labels, certificates, technical approvals and etc. and to promote transparency and understanding of technical content of such quality indicators;

- to collect, monitor, analyse and diffuse information on construction pathology relative to implementation of innovative technologies in construction at the European level in order to facilitate and accelerate feedback of experience related to the use of such technologies necessary to develop relevant measures of risk prevention and control as well as appropriate insurance covers.

Discussion which took place during the Workshop on the European bodies i.e. Cooperation Committee and Technical Agency proposed by the ELIOS team has revealed that an option of creating a single body instead of two independent entities was preferred by the Commission and by the Stakeholders. It was considered that a single organisation would be able to operate in a more coherent manner and that it would contribute to reducing potential coordination difficulties between the two proposed units.
Taking into account the comments and opinions exprssed by the Stakeholders the ELIOS team have decided to modify the initial recommendation and to propose creation of a single body – European Agency for Construction Insurance, which would merge the previously envisaged missions of Cooperation Committee and Technical Agency.

The European Agency for Construction Insurance would fulfill four main missions:

- Interface between the Commission and the Member States in the matters relating to construction insurance;

- Single point of contact for information about cross-border construction activities;

- Handbook of quality labels and indicators at the European level;

- European observatory and database of construction pathology relative to eco-technologies;

It should be underlined that the proposed body would not be intended to hold any decision-making power, which should remain the competence of appropriate national and European institutions. As a body composed of a panel of stakeholders interested in development of sustainable construction, the proposed Agency would instead encourage discussions and reflexions on construction risk, liability and insurance at the European level, contribute to facilitating cross-border activities by improving access of construction firms to information on liability and insurance regimes in the EU Member States, by encouraging mutual recognition of quality certificates and labels as well as mutual understanding of national technical requirements and practices. The body would also help to increase the understanding of risk related to innovative construction through collecting, analysing and diffusing information on construction pathology at the European level.

A detailed confidential document specifying the proposed agenda of activities of the Agency as well as its proposed organisational structure and an estimate of financial and human resources required for the functioning of the Agency has been submitted by the ELIOS team to the European Commission on 31st March 2010.

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11. Special report on liability and insurance regimes in 27 EU Member States

ELIOS

Case studies concerning the realisation of sustainable building parts

Objective

The aim of these case studies is to describe in different European context the relations between construction stakeholders and insurers during projects aiming at the realisation of sustainable building.

Definition of sustainable building

The international standard ISO 15392 is applicable to buildings and other construction works individually and collectively, as well as to the materials, products, services and processes related to the life cycle of buildings and other construction works. The definition used for the standard will be used as a reference for the ELIOS project[1]:

Sustainability is considered in paragraph 3.20 (p.5) as the « *state in which components of the ecosystem and their functions are maintained for the present and future generations.* »

NOTE 1: Sustainability is the goal of sustainable development (3.21) and can result from the application of the concept of sustainable development.

NOTE 2: In building construction, it relates to how the attributes of the activities, products (3.17) or services used in the construction work (3.7), or the use of the construction works (3.8), contribute to the maintenance of ecosystem components and functions for future generations.

NOTE 3: While the challenge of sustainability is global, the strategies for sustainability in building construction are local and differ in context and content from region to region.

NOTE 4: "Components of the ecosystem" includes plants and animals, as well as humans and their physical environment. For humans, this includes a balancing of key

[1] ISO, *Sustainability in building construction —General principles,* ISO/FDIS 15392:2008(E).

elements of human needs: the economic, environmental, social and cultural conditions for societies' existence (ISO/FDIS 15392:2008, p.5).

Focus of the study

Though the scope of sustainability is much wider than energy, case studies will focus on building including energy-related equipments as most of known sustainable building projects emphasize the energy aspect.

A short list of building parts already available on the market will be selected for the ease of the study. Some of these parts may not be considered as innovative in one European country (because their level of diffusion is already high) and innovative in surrounding European countries:

- Photovoltaic roofing or façade
- Solar hot water heater
- External insulation
- Wooden structure

Application for both new and existing buildings will be addressed according to availability. If possible buildings in operation for some years will be chosen.

The interest of a short list is to facilitate comparison between similar projects in different European countries.

In case of difficulties to identify projects from the above listed examples, other cases could be considered:

- Earth to air heat exchanger
- Earth exchanger heat pump
- Wind mill integrated on buildings

Method

Face to face (or phone) interview after a first contact followed by the communication of an interview framework (see below).

Targeted countries

France, Germany, Netherlands, Poland, UK covering the main construction insurances regimes in Europe.

Reference situation

A client plans to realise (or already realised) one (or several) of the mentioned building parts

Targeted clients are local authorities or developers (office buildings, collective housing), where technical skills and significant projects may be more easily identified than by targeting individuals.

Interview framework

Description of the project

Location

Description

Expected performances

Investment cost

State of the project (design phase, under construction, in operation (date))

Other information

Motivations for the project

Voluntary (explicit motivations)

Compulsory through regulation (reference of regulation)

Existence of incentives (subventions, tax reduction, income from energy production …)

Other motivation

Who is at the origin of the project? (Alphabetic order)

Architect

Administrations (construction/urbanism, taxes …)

Contractors

Design office

Funding agency

Insurers

Other actors …

Does the client or the developer need an administrative authorisation before launching the project?

If yes:

- Please provide details concerning the authorisation (building permit for instance),
- Is there any control after completion? What is controlled?
- What happens in case of non-conformity?

To which kind of information does the client or the developer have access before launching the project?

- Technical performances of the building or the building parts (for example in the case of photovoltaic roofing, information about the performance of the item or the watertightness…);

- Durability of performances;
- Sanitary impacts;
- Other information.

What are the sources of information?

- Commercial and technical documentation,
- Third party performance assessment (technical),
- Certification (which performance?),
- Other sources

At the end of the project what is guaranteed?

- Good execution,
- Energy performance,
- Sanitary guarantee,
- Other guarantee

Origin of guarantees

- Contractual agreement between client and construction professionals (such as suppliers, contractors…); In this case what is the nature of the guaranty? Legal, commercial…
- Compulsory insurance (name of the insurance);
- Voluntary/Facultative insurance (name of the insurance);
- Other origin.

Conditions associated to guarantees

- Does the guaranty start at the reception?
- What is the duration of the contract?
- What is the scope of the guaranty? (For example does it concern the whole buildings or only one item?)
- What is the cost of the guaranty?
- Are there any additional conditions?

In case of claims what is the follow-up?

- Does the insurance company mandate an expertise?
- What happens in case of damages? (Repair, replacement, compensation…)
- Is there any national compensation framework?
- How and when does the insurer interfere in this claim?

(Subsidiary question to insurers (through company contact))

- Are there specific risks associated to sustainable solutions?
- How are specific risks associated to sustainable solutions assessed?
- How are claims analysed?
- Are these analyses disseminated to construction professionals?
- How? (data base, publications …)
- Other issues

Case study : Innovative energy saving building in Lieusaint (France)

1. Description of the project

Photograph 1 and 2: the building site in November 2009 et February 2010

1.1. The history of the project

In 2005 the Ministry of Culture launched a contest in order to promote the European architecture. This operation lead to a cooperation between CABE in the UK (Commission for Architecture and the Built Environment) and DAPA in France (Direction de l'Architecture et du Patrimoine). The aim was to build social housing made of wood on both sides of the Channel.

The winning team gathered French and British architects (who decided to leave the projects very rapidly). The project concerned 31 dwellings. It aimed at getting the certification "Habitat Environment" (www.cerqual.fr). To obtain this label, three topics had to be to be covered:

1. The environmental management of the project;
2. The reduction of energy and greenhouse gas emissions;
3. Green gestures (cooperation with tenants, information of the facility manager who is going to operate the building in the future).

It was quite important for the housing company to get this label. Indeed some subsidies are granted only if the housing company is able to reach some environmental targets.

The general contractor was selected after an unfruitful invitation to tender. It was not possible to allot the batches the first time for three factors:

1. In 2007 the construction industry was growing and firms were overbooked;
2. Very few companies had competences for wood construction;

3. The estimated cost of the project had been largely underestimated (by approximately 600.000 euros).

1.2. Major technical choices:

The 31 dwellings which are distributed in four buildings will be low energy (the energy consumption is 25% lower than the one required by the thermal regulation 2005). Several solutions were introduced to decrease energy consumptions and improve the insulation of the dwellings. These solutions were regarded as innovative by the client, the specialized contractors and the architect while the general contractor that is specialized in wood construction considered them as traditional. The general contractor believes that it is not necessary to use innovative solutions to build low energy building. Consequently it tends to favor traditional solutions that do not require technical advisory notes which are issued by CSTB when innovative procedures, materials, components and equipment, are introduced.

Even if nothing was innovative for the contractor, several solutions enhanced the complexity of the project:

- All the wood structure was prefabricated in Serbia. The use of prefabrication elements was new for specialist contractors and for the architect. It required architects, contractors and designers to spend around six months in design studies. All specialist contractors had to anticipate their box-out to fit tubes and networks through walls and floors. These elements lengthened the design stage (according to the contractor for traditional projects only two months are spent in design studies). To monitor the manufacturer the contractor relied on its small affiliate located in Serbia and employing three engineers. They are mainly in charge of checking the quality of the production.

Photograph 3 : façades (9 meters) prefabricated in Serbia

- The curve shape of the buildings reinforces the complexity of the prefabrication phase. The architect indicates that to make the industrialization process more efficient, it would be necessary to simplify the design of the building.

Photograph 4: the curve of the building

- Blower-door tests were performed to help determine a home's air tightness and monitor the performance of the buildings. The contractor has its own equipment to check this performance. One of the tests was negative and made the contractor aware of air leakage.

  The use of blower-door tests is new and due to the development of certified buildings consuming low energy. To get the certification the client needs to prove that there is no air leakage.

  Proper building air tightness will help:

  - Reducing energy consumption due to air leakage;
  - Avoiding moisture condensation problems.

- All buildings are covered by a green roof. In some cases the slope of the roof reaches 45°. The sprinkling of the roof is based on rainwater harvesting. The system that gathers and stores rainwater aims at limiting water consumption and annual charges supported by the tenants.

- Solar thermal systems for water heating are used for each building.

Photograph 5: Structures that will support solar panels and prefabricated façades

According to the general contractor nothing was innovative but the curve-shape reinforced the complexity of thermal calculation.

However specialist contractors (electricity and plumbing) had never been involved in this type of project using prefabricated elements. Because of this change they had to anticipate their box-out. Due to their lack of experience, they had difficulties to anticipate some of these tasks. In some cases they forgot to do it. It means that they had to make a hole in the walls on the building site with the risk to decrease expected performance.

1.3. Financing issues and costs of the project

The estimated price for the 31 dwellings is the following (table 1):

Table 1: Estimated costs

	Euros (including taxes - VAT 19.6%)
Land taxes (driveways and various services, parks, other taxes…)	1 085 957
Building activities	4 470 890
Fees	530 390
Total	6 087 237

Four different bodies were involved in the financing of the project:

1. The building owner who supported 9% of the cost of the project;
2. The State, the regional council, the local council and EDF brought subsidies which covered 30% of the cost of the project;
3. Two loans with very low interest rates were granted for 40 and 50 years. They cover 61% of the cost of the project;

4. The ground was free of charge and offered by the municipality of Lieusaint.

It appears that the costs of the project were underestimated. The project was much more complex than expected. Usually the design office, the architect, general and specialist contractors spent two months in pre-planning and detailed design studies before launching the construction stage. In this case the actors spent six months. This was due to the complexity of the structure and the use of prefabricated elements. All drawings had to be sent to the supplier of prefabricated elements who was located in Serbia. It reduced the flexibility that is currently enjoyed by site-based construction. But it was also one solution to guarantee the quality of the final product.

2. Actors of the project

2.1 The general contractor

The general contractor is specialized in wood construction. It employed 23 people. Five of them worked for the design office of the contractor. Most of its market usually concerns individual housing. Despite its experience it had never been involved before in such a large project.

The contractor usually prefers to monitor the whole construction process in order to avoid damages such as inappropriate implementation.

In this project it preferred to focus on the building activity and to leave plumbing and electricity to other specialized contractors.

2.2. The design office and the architect

The architecture agency employs eight architects. Created in 2000 it was involved in several national and international projects concerning housing, landscape development and bridges. Several of these projects were low energy consumption buildings.

A design office specialized in thermal engineering was also involved. It was created in 1982 and employs 24 people. It had many references before this project and is considered by many professional actors as one of the leading office in the field of sustainable construction.

2.3. The client

The social housing company owns and manages 6000 dwellings (approximately 18000 tenants). It employs 117 people. Since 2007 it developed an environmental and social policy. One of its goals is to improve the energy efficiency of its housing stock and to reduce its greenhouse emissions. It has implemented portfolio management based on environmental criteria. Its buildings are classified according to their energy performances. Respectively 42.8% and 44.5% of its stock were classified in the categories C (91 to 150 kWh/m ^{2} /an) and D (151 to 230 kWh/m ^{2} /an) in 2008. In addition this same year, 11.9% of its dwellings were equipped with devices reducing water consumptions.

The cost of the project was higher but the housing company expects to lower the vacancy rates by developing dwellings with low energy consumptions. It also hopes to reduce the level of unpaid rent.

2.3. The insurance companies

The insurance company of the client sent a technical expert who is in charge of evaluating the risk of the construction project. The evaluation of the expert is based on the characteristics of the procedures, materials, components and equipment that are used during the construction projects. It also appreciated the quality and the references of the firms that are involved in the project. If one product is new it tries to appreciate whether the manufacturer has developed tools to train the workers of the building site.

The aim of this expert is to point on factors that could lead to future damages and to evaluate the risk in order to price it.

According to the client the complexity of the project did not increase the costs of the project. The client had already signed a framework agreement with its insurance company. This agreement set out terms and conditions under which the construction projects can be made throughout the term of the agreement. All solutions used during the course of the project followed this agreement and did not require more studies. Moreover the project which was complex did not require any technical advisory notes.

The contractor paid to its insurance 1.7% of its turnover on the project. This rate was quite high and was due to the lack of return on experience of the insurance company for wood construction. For two years the rate was quite high for the contractor because its insurance company lacked data and information on wood construction. However in 2010 the insurance company accepted to decrease its rate to 0.6%. This was explained by the good record of the general contractor. Moreover the insurance company considered that the risk is lower when design and build are done by the same actor.

The use of the above mentioned eco-technologies apparently did not modify the general relations between the insurers and the other stakeholders, compared to ordinary projects. According the insurance company involved in the project, for any kind of project the aim is to appreciate risks. Environmental innovations are not considered as more risky as product and process innovations. In both cases the approach of the insurance does not differ.

3. The guarantees

Responsibility of perfect achievement will run for a period of one year starting from handover of the works to the client.

Responsibility for satisfactory functioning is for two years. It covers minor works and starts from handover of the works to the client.

Decennial responsibility will start from the handover of works to the client. It covers two aspects, the solidity of construction and the fitness for purpose.

Third party responsibility under common law starts when the third party is damaged. It lasts for a period of 10 years.

In case of damages insurers will send an expert who will be in charge of evaluating the responsibility of the different stakeholders. In complex projects where design and construction are concurrent, it is more difficult to appreciate the responsibilities of each party.

Conclusion

The cost of the project appears higher than for a traditional project. This is explained mainly by the cost of the studies which were done at the design stage and appeared to be much more detailed and complex.

In addition many products and materials are not fabricated in France and are imported. The panels were manufactured in Serbia and many products were bought in Germany where the market for passive house is more developed than in France.

Blower-door tests which are not widespread in France yet[1] appear to be a good solution to reduce some risks attached to the energy performance of the building.

The use of several eco-technologies apparently did not augment the direct costs of the project. It just modified the design and construction phases and the relations between the general contractor and installation and finishing companies. For example electricity and plumbing companies had to make box-out at the design stage and they were not allowed to drill on site in order to guaranty the energy performance of the dwellings.

No extra insurance cost was recorded. This is probably due to the framework agreement signed between the client and its insurance company. Moreover the general contractor had good references for its past wood construction projects. This allowed reducing its insurance costs.

[1] With the regulation concerning low energy consumption buildings (around 50kWh/m²/year) these tests will become compulsory.

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27/10/2009

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Liability and insurance regimes in the construction sector – case studies in Germany

HN-41/09/016

Associated documents: None

Summary:

Within the Project "European Insurance Liability Organisation Schemes (ELIOS)", two case studies concerning the realisation of sustainable building parts in Germany have been prepared. The first case study deals with the realisation of energetic modernisation of a nursing home in Stuttgart while the second one involves the construction of a passive primary school in Frankfurt. These case studies would help to understand the liability and insurance regimes in the sustainable construction sectors in Germany.

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Preface

This report describes two case studies that are formulated within the project "European Insurance Liability Organisation Schemes (ELIOS)". They are concerned with the construction and renovation of the sustainable building and building parts. The aim of these case studies is to collect detailed information on the liability and insurance schemes of some on-going or finished public funded projects in Germany.

Two different projects have been carefully selected as case studies. The first study deals with an on-going project on the realisation of energetic modernisation of a nursing home in Stuttgart while the second one incorporates a finished project on the construction of a passive primary school in Frankfurt. They are managed by the city Stuttgart and city Frankfurt respectively.

The case studies have been designed at first by delivering the pre-formulated questionnaires to the respective project managers and then by interviewing face to face. Thus it helps to describe where, why and how construction and insurance mechanisms are met for these particular projects.

Case Study 1: Stuttgart Building Department

1. DESCRIPTION OF THE PROJECT

a. Where is the project implemented?

The name of the project is "Energetic modernisation of the nursing home Hans-Rehn-Stiftung". It is implemented at the city of Stuttgart in the state of Baden-Württemberg in Germany. The postal address of the project site is Supperstr. 28-32, 70565 Stuttgart-Rohr, Germany.

The owner of the property is "*Eigenbetrieb Leben und Wohnen*[1]". It offers institutions and services to elderly and homeless people. It is the company for social services of the city of Stuttgart.

The client of the project is the city Stuttgart, the state capital of Baden-Württemberg and the designer is the building department (*Hochbauamt*) of the city Stuttgart. The building department is authorised by city Stuttgart to maintain the building inventory and acts as a representative of the city Stuttgart for new construction, renovation and expansion of all the public buildings, such as schools, kindergartens, hospitals, city halls, etc. The building department does not carry out any construction by itself; rather it is accomplished by private construction companies. A major part of the work is transferred to freelance architectures and engineers as well. About 15% of the project tasks are carried out by building department. In this project, it has authorized and supervised about 10 executing handcrafts companies to fulfil the tasks.

[1] www.leben-und-wohnen.de/hans-rehn-stiftung/index.php

b. Give a short description of the implemented (or ongoing) project.

The building complex has been built in 1977 as elderly people and nursing home. Currently, it has the capacity for 122 full time residents (including 2 short time residents), 50 apartments, 1 meeting place, 1 big therapy zone along with swimming pool, underground garage, 1 wing with 18 apartments (1 to 3 room apt.) for the staff. In total about 200 residents live in this building complex.

The renovation project has started in 2007. It consists of 2 phases. The first step (*erster Bauabschnitt*) will continue until end of 2009 and the case study is mainly related to the activities involving this step. In this part, the heating system of the building has been changed. Until 2007, the elderly people home used night storage heater, which was a really cheap solution in the 70s. With increasing energy prices and discussions about climate change, the old heating system has become uneconomic and wasteful. Therefore, it was to be exchanged against a gas-powered combined heat and power unit, supported by a 280 m² solar thermal system, 12 ground probes and a make-up air unit (*Außenlufteinheit*). One of the already existing 100 m³ buffer vessels has been integrated into the new systems and for the coldest days of the year, a peak load boiler has been installed.(figure 1)

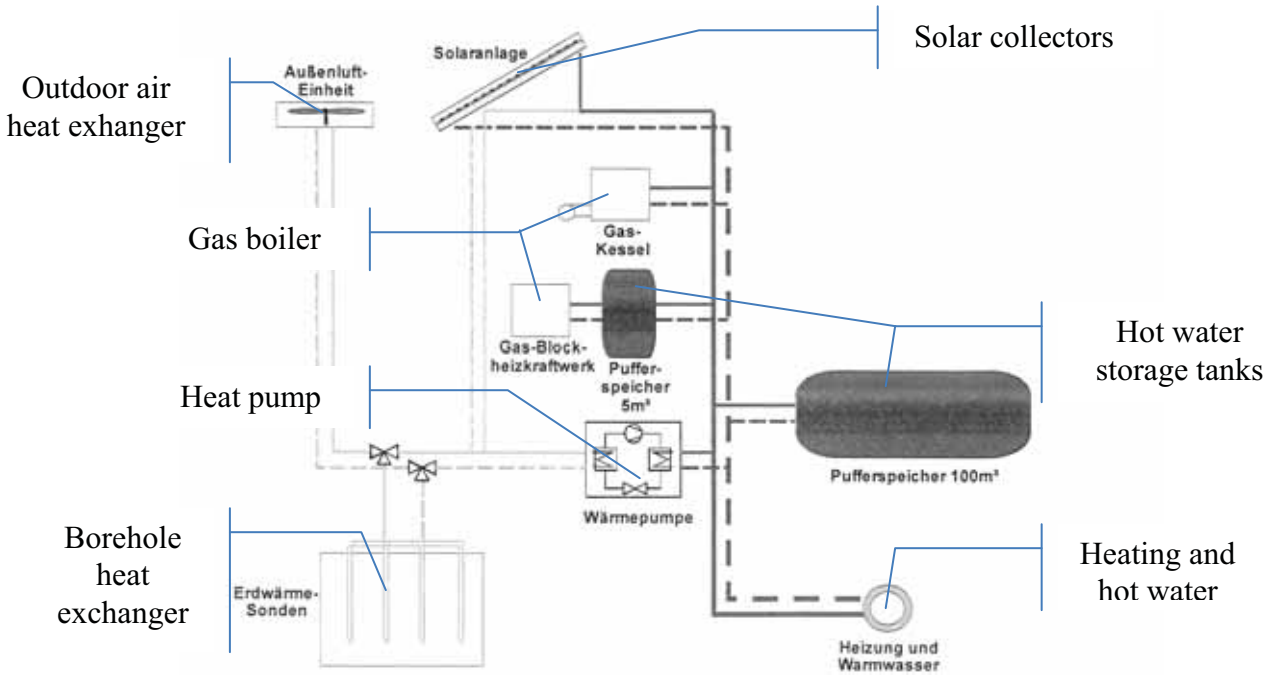

Figure 1: Energetic system

In the second step (*zweiter Bauabschnitt*) of the project, the outer shell of the building will be refurbished by 2013 at the latest. It is planned to insulate the ceilings of the cellar and the underground parking, to extend the insulation of the perimeter, and to insulate roof which is not renovated yet. Moreover, all windows and doors will be replaced according to the German standard (EnEV 2007[2]) and new security clauses will be met.

[2] EnEV 2007: *Energieeinsparverordnung* 2007 (German regulation for energy saving in buildings and building systems). More info at http://www.enev-online.net/enev_2007/index.htm

c. What performance (energy relevant or other kind of benefits) do you expect from the project?

After completing the renovation, it is expected that the energetic performance of the building will improve a lot. For example, with the earlier system, the building was heated with electrode boiler which caused higher economic (expenses for heating) as well as higher ecological (CO_2) costs. But the newly introduced energy performance improvement (implemented in both phases) is expected to reduce the energy cost by 128,000 Euro/year as well as 1,131 tons CO_2/year. This corresponds to a reduction of the CO_2 emissions of 81% compared to the previous value.

d. Investment cost

The total investment cost of the project is about 2.2 million Euros. The detail is given below:

Type of construction	**Cost in Euro**
Technical installation	1,554,000
Building envelope	485,000
Operation cost per year	94,000
Total (including public funding in 2007)	**2,199,000**

e. State of the project

The project is still in the first phase which will be closed at the end of 2009. The thermal solar heating installation is yet to be finished. It is not clear when the 2nd phase will start. It mainly depends on the decision of the communal board; hence it is assumed that the 2nd phase will be finished at the latest in 2013.

The project was changed many times after the initial official design, mainly due to arising needs and concerns. At first geothermal and electric heating energy system solutions were planned for heating purpose, but as a gas access could be realized, it was changed to a gas-CHP and the former described heating solution (s.a. 1 b). The additional gas-powered peak load boiler was planned to be used during probable extreme colds (minus 10 degree Celsius), when the nursing home might not be sufficiently heated with geothermal energy only. However, pellet heating was not realised due to scarcity of space and the exposure of respirable dust particles.

f. Other information

- The residents of the nursing home are the direct beneficiary of this project as their living standards have been upgraded, especially through the new insulation and better air quality. Moreover, the *Eigenbetrieb Leben und Wohnen* (ELW) are also benefitted, because of the substantial decrease of energy cost and of an unquantifiable gain in image.
- The project is funded by both public and private agencies, such as financial aid from state of Baden-Württemberg and city Stuttgart: 625,000 Euro, donation from Hans Rehn Stiftung: 700,000 Euro and credit financing through ELW: 874,000 Euro
- There have been some changes in the initial investment cost as well as funding from different sources.

2. MOTIVATIONS OF THE PROJECT

a. How was the project initiated?

The project was voluntarily initiated.

Generally, the Office of Environment Protection[3] carries out continuous surveillance on the consumption and cost of heating, water and electricity within the public buildings in Stuttgart. It identifies particular buildings that are subject to higher energy costs. This nursing home had larger energy consumption than other facilities in Stuttgart. Therefore, in order to reduce the annual cost of operation, this renovation project has been recommended and later initiated.

(*The Office of Environment Protection also indicates possible sources of funding for any renovation.*)

b. Is any laws/regulation of local or federal government encouraged/stimulated implementing the project?

There was no law or regulation that influenced to realize the project.

c. Do/did you have access to incentives of federal or local government that encouraged you to implement the project?

Yes, financial incentives from the local government were available. It inspired to initiate the project. On the other hand, moral incentives (e.g. self-esteem and approval or even admiration) also inspired to realize the project.

Generally, the use of credits was uninteresting for the city Stuttgart because of the interest payments and the city could manage to finance the project by itself.

However, it was decided not to implement the cheapest solution which was proposed in the feasibility study, because inflows of subsidies and incentives helped a more efficient and less CO_2 emitting solution more attractive.

d. Other motivation

The main goal of launching the project was the reduction of energy cost.

Sustainability was not the main motivation at the beginning, but it became an important aspect as the project had been progressed, because energy efficiency and the use of renewable energies became an every day's topic.

[3] The Office of Environment Protection is one of the local administrative offices in city Stuttgart. Its aim is to observe the effects of all spheres of activity of the city administration on the issues of the environment by following the interest of an enduring and sustainable development and introduce these topics into the communal planning and decision processes. It is one of their tasks to monitor the energy consumption of 1,400 building in ownership of the city and more than 2,000 other construction, e.g. sewage plant. At the moment, 170 buildings are monitored separately for its energy consumption and 96 buildings for its power consumption. The consumption can be tracked down to an accuracy of 15 minutes. The biggest consumer of every category, e.g. schools or nursery homes, are subject to further investigation and if necessary, it recommends renovation and indicates possible sources of funding.

3. WHO DID YOU CONTACT FIRST?

During the project, how is the contact initiated/made and whom do you contact first?

At first the Office of Environment Protection has checked if any regulation and incentives exist that might fit into the proposed renovation work. Then it has discussed with the owners, here ELW, for their willingness to carry out a renovation project. When the owner has agreed, the building department of the city Stuttgart starts organising and coordinating the whole project. The planning office of the city Stuttgart acts as project manager. About 20% task (project planning and management) is carried out by the city itself, whereas the rest of the task is given to freelance architectures and engineers (project design) as well as external engineering and consultancy companies (mainly installation of sustainable construction solutions, heating, electricity, etc).

4. IS AN ADMINISTRATIVE AUTHORISATION NEEDED?

a. Do you need an administrative authorisation to commence the project?

Yes, the local Office of the Building Law (*Baurechtsamt*) has granted permission for the renovation with some conditions to meet all valid standards, e.g. special fire doors at the combined heat and power plant (*Blockheizkraftwerk*). So, permission has been required.

b. Is the project controlled after completion?

Yes, the Office of Environment Protection of the city Stuttgart monitors the energy consumption of the building.. This yearly monitoring continues until the building ownership is changed or the building is demolished. If consumption is higher than expected, EP office investigates the cause of higher consumption and initiates counter actions, e.g. suggestions for repair or renovation

5. AVAILABLE INFORMATION FOR THE CLIENT BEFORE THE PROJECT

a. What sort of information was needed or was available before the project started?

Technical information about the building was collected before the project had started. The structural maintenance (*Bauunterhaltung*) department generally carries out such detailed survey on all the public buildings in Stuttgart.

There was also no evidence of hygiene problem in the building and it was known that the energetic modernisation would be ecologically and economically feasible.

6. SOURCES OF INFORMATION

a. Where did you get the information?

The information was mainly collected from the city office and its corresponding departments (e.g. building physics department for thermal installations). If needed, external architects and engineering companies were also asked to collect more information.

b. Did you have difficulties in access to information?

No, everybody had own responsibility and the definition of responsibility/work was clearly mentioned within the project paper.

7. WHAT IS GUARANTEED?

a. During the implementation of the project, what is guaranteed?

Good execution of sustainable construction is guaranteed throughout the project. This guarantee is assured within the project contracts prepared between city Stuttgart and concerned companies that are responsible for realisation of sustainable construction.

b. What types of guarantees is provided and who provides them?

The guarantee is provided for individual materials of sustainable construction and facility, both technical and operational, depending on the specifications mentioned in each contract. Here, it has to be differentiated between a guarantee and an insurance. A guarantee is granted by the company who built or installed the product that it will work for a certain period of time without problems as announced. This is demanded by law in Germany. On the other hand, an insurance is a treatment between any company and the insurer, who is taken over a risk from the company for a certain payment.

The guarantee period varies according to individual construction type. General guarantee for all sorts of construction in this project is provided for 4 years. But the construction companies ensure city Stuttgart that there will be no need of extra renovation/installation within the next 15 years.

8. ORIGIN OF GUARANTEES?

How the guarantees are originated?

Guarantee is maintained through contract between city Stuttgart and the corresponding companies who are responsible for realisation of sustainable construction facilities.

The contract is prepared following the *Vergabe- und Vertragsordnung für Bauleistungen* (VOB - contracting rules for award of public works contracts[4]) guidelines. VOB jurisdiction is prepared and updated by the *Deutsche Vergabe- und Vertragsausschuss für Bauleistungen* (DVA - German award and contract for works committee). VOB is generally accepted as the basis of contracts in the construction industry. It is neither law nor regulation, but a set of rules to which the contract in the award of the works can relate. All public construction works must be carried out according to the VOB rules.

[4] http://www.bmvbs.de/-,1536/knoten.htm

9. FOLLOW-UP IN CASE OF CLAIMS

a. How are the claims followed up?

Claims are generally followed up through compensation (repairing/replacing building parts/equipments). In case of claims within the guarantee period, the construction company takes care of everything related to claims. The experts assess the nature of damage, determine its causes and then quantify the loss. If there is any disagreement, sometimes the involved parties discuss together to reach a satisfactory solution. When the guarantee period is over, the city Stuttgart itself takes care of the claims and responsibilities.

b. Who takes care of it and under which conditions/limits?

The responsibility and the associated conditions are clearly formulated in the contract according to VOB guidelines.

c. How clear is the responsibility formulated in contracts?

Responsibility is clearly formulated.

d. Did you experience any problems so far? If yes, what kind of problem and how did you deal with it?

No big problem showed up in this project until now. However, in general, there are disputes regarding responsibility of the damage. Sometimes they need to be settled down to the court.

e. What kind of other problems could be relevant for you, if any?

Nothing really, potential problems are addressed at the very beginning. It is mentionable that the disagreement mentality of taking responsibility of damage has increased in the last 10 years, meaning that more claims are tracked to court, as it gets harder and harder to find extrajudicial solutions acceptable to all sides.

10. SUBSIDIARY QUESTION TO INSURERS (THROUGH COMPANY CONTACT)

a. How are specific risks associated to sustainable solutions assessed?

Every construction company participating in realising sustainable construction must be insured. The construction companies and their associated insurance companies assess the risk. But the methods/criteria of risk assessment are not revealed before the city office.

b. How are claims analysed?

Any claim due to the damage of the sustainable construction within the guarantee period is beard by the construction company. It is not revealed how the claim is assessed. But after the guarantee period, the internal experts of the city office analyse the claims.

c. Are these analyses disseminated to professionals? (reference to the French « sycodes »)

When problems/arguments among the city and companies regarding the assessment of damage showed up, they are sent to the experts or professionals for better assessment or neutral judgement

d. How? (database, publications …)

Documented in paper format and kept for 30 years.

11. CONDITIONS ASSOCIATED TO GUARANTEES

a. Starting point

Guarantees generally starts on the day of final acceptance (commissioning date).

b. Duration

The guarantee is basically formulated for 4 years, depending on the individual contract. In this project all guarantee phases have been set to 4 years.

c. Scope/exclusion

Complete guarantee of the whole project is not given; it is always specific to the company having been responsible for the particular task. If more than one of the authorized companies are involved into the case, a solution for all has to be found out. Contents of guarantee cannot be disclosed, there are legal obligations.

d. Cost

The calculation of costs of guarantee is very complex. The companies do it themselves, they have their own method of calculations, and therefore, it is not revealed before the city. What percentage of total cost is covered within the guarantee is also unknown.

12. OTHERS

- The craftsmen involved in the project were trained in an apprenticeship and they were employed according to the specifications and standards mentioned in the VOB[5].
- Quality of material is difficult to assess. For example, to test the quality of concrete and to archive some original pieces for future needs, e.g. incident with the building, a small cube needs to be cut out of the wall or the basement for testing, e.g. resistance against pulls and pushes.
- All the companies participating in the project are bound to security deposits. They have to proof financial guarantees to the city they are working for. The rate is usually 10 % of the contract volume during the construction period as well as 5 % for the warranty period. These guarantees can either be given by a money deposit or by the company's bank as a bond to the city by freezing the volume on the company's bank account. A deposit that has been lodged during the construction period can be used for the warranty period as well after a successful acceptance of the work.

[5] In Germany, the craftsmen involved in construction are generally trained (for 3 years). So they possess certifications before the project starts. Sometimes the suppliers of products employ their own craftsmen to install special services. However, companies can employ untrained workers for simple works, but they have to be supervised trained ones.

Case Study 2: Frankfurt Energy Management Department

1. DESCRIPTION OF THE PROJECT

a. Where is the project implemented?

The name of the project is "Planning and construction of a passive house primary school". It is implemented in Kalbacher Höhe 15, 60439 Frankfurt am Main.

The contact person for this project is Axel Bretzke, Department of Energiemanagement, Building Office (*Hochbauamt*) of the city Frankfurt, Gerbermühlstr. 48, 60594 Frankfurt am Main.

b. Give a short description of the implemented (or ongoing) project.

The project has been initiated to construct a new building for kindergarten and school as well as a gymnasium for 400 pupils, 100 children, and 50 teachers and others employees. The net building area is 7,670 m². The type of sustainable eco-construction includes external insulation, frost insulation, sun-protections, ventilations, wood pellet boiler, and photo voltaic (at the roof, installed by an external investor, Mainova AG). The goal of this project is to achieve passive house standard.

c. What performance (energy relevant or other kind of benefits) do you expect from the project?

This project would ensure better indoor/room environment, reduced energy costs, and nearly neutral CO_2 emission (through passive house and pellet heating system) than traditional non-passive houses.

d. Investment cost

Total investment costs of the project was 16.7 Million Euros (including extra cost of 890,000 Euros for passive house construction), whereas construction costs and costs for technical construction were 11.1 Million Euros. The rest 5.6 million euros were costs for the ground, site development, and the outdoor facilities.

e. State of the project

The project's construction phase continued for about 15 months. It began in September 2003 and was finished in November 2004. However, there were some changes after the initial official design. For example, a wood pellet boiler was installed instead of waste powered boiler which was initially planned for district heating.

f. Other information

- The main goal of launching the project was the necessity of a school in that neighbourhood. And the city of Frankfurt, renowned for its exemplary function and being concerned about energy consumption, decided to realise a passive house so that the best indoor climate is maintained throughout the year.
- The direct beneficiaries of the project are the school children themselves.
- The project was funded by "*Deutsche Bundesstiftung Umwelt* (DBU)" and State of Hessen.

2. MOTIVATIONS OF THE PROJECT

a. How is the project initiated?

The project was launched as a necessity.

A new residential area was planned in the Riedberg area in Frankfurt. As a result, a new primary school with kindergarten had to be built there as well. It was desired that the neighbourhood needed a school which should be sustainable and where air quality of the class rooms should be optimal. Therefore, construction of a passive house was taken into consideration. Cost-benefit analyses with other types of construction were carried out as well.

The Development Authority Riedberg (*Entwicklungsgesellschaft Riedberg)*, having been responsible for the development of the whole residential area (e.g. planning and building streets, zoning and selling building sites and also choosing which official buildings would be needed in this area), asked the building office of city Frankfurt to take over this project. The architect's office "Architekturbüro 4a" had been ordered to develop the project blueprint. The energetic concept was realised by the Passivhaus Institut[6], who also monitored the school in its first years of operation, and Transsolar[7]. The building equipments were installed by a private company, ICZR Ingenieur Consult.

[6] Passivhaus Institut performs research and development on high-efficiency energy systems and use. More info at http://www.passiv.de/07_eng/index_e.html
[7] http://www.transsolar.com/

The motivation behind the construction of passive house was to make a 'show-and-tell object' to support the decision of the city of Frankfurt that all public buildings have had to be constructed as passive houses since 2007.

b. Is any laws/regulation of local or federal government encouraged/stimulated implementing the project?

There was no law that obliged the construction of school building as a passive house. But definitely the feeling of self esteem and admiration encouraged the city Frankfurt to initiate the project which stands as a unique example of eco-construction.

c. Do/did you have access to incentives of federal or local government that encouraged you to implement the project?

In the beginning, no financial incentives of the federal or local government encouraged to implement the project. Later on, as the project was initiated, it was partially supported by both federal and local government. For example, the State of Hessen provided 10,000 Euros for the investment into the pellet heating system instead of district heating and the *Deutsche Bundesstiftung Umwelt (DBU)*[8] financed 250,000 Euros as the monitoring cost of the Passivhaus Institut.

d. Other motivation

Development of sustainable building and sustainable community as well as achievement of optimum room environment was desired. The ultimate goal was to achieve the certificates of "Green Building" and the Passivhaus Institut's "*Qualitätsgeprüftes Passivhaus*".

3. WHO DID YOU CONTACT FIRST

During the project, how is the contact initiated/made and whom do you contact first?

At first, the school office of the city requested City Frankfurt to construct a new school building in the Riedberg neighbourhood. The building department (architects mainly) of the city Frankfurt reacted on it and initiated the project as a project leader. The financial charge was taken by the *Entwicklungsgesellschaft Riedberg GmbH*, which is responsible for the development of the new housing estate in the Frankfurt-Riedberg neighbourhood.

The project management (administration, formulation of rules and regulation, conditions, financial matters etc.) as well as primary inspection was carried out by the building department itself. Other specialists, e.g. architects, building constructors, technology experts, building foundation experts, energy and environment and quality assurance experts within the city office prepared the specifications for concerned construction standards.

Then external design office and engineering firms were asked to submit their design and proposals according to the specification of individual components of constructions. Afterwards, the building department accepted the best submission – the cheapest offer which fulfils all of their criteria – and asked to implement individual construction and installation.

[8] DBU is one of Europe's largest foundations and promotes innovative and exemplary environmental projects. More info: http://www.dbu.de/359.html

4. IS AN ADMINISTRATIVE AUTHORISATION NEEDED?

a. Do you need an administrative authorisation to commence the project?

Yes, the project needed permission from City Building Authority of city Frankfurt. It decided whether the project would fit according to the plan as well as the neighbourhood characteristics. After some minor changes in the initial plan, the project was authorised.

b. Is the project controlled after completion?

Yes, the project (and its components) is controlled after the completion. The Passivhaus Institut, who is together with Transsolar responsible for the energetic quality assurance and the energy concept, also monitors the energy consumption of the ~~project~~ school after completion of the project.

5. AVAILABLE INFORMATION FOR THE CLIENT BEFORE THE PROJECT

What sort of information was needed or was available to you before the project started?

Technical information on the construction of passive house was available before the project had started. Information on inferior quality of room temperature and allergy was also available.

6. SOURCES OF INFORMATION

a. Where did you get the information?

The information came from personal experience on similar project, personal official contact with other institutes (e.g. ministry). Moreover, knowledge on technical reports of other projects, certification of certain types/standards as well as activities of other institutions, e.g. Passivhaus Institut (mainly for scientific knowledge) also helped to formulate the project.

b. Did you have difficulties in access to information? If yes, which kind of difficulties/ which kind of information

No, there was no problem in accessing relevant information.

7. WHAT IS GUARANTEED?

a. During the implementation of the project, what is guaranteed?

Good execution was guaranteed throughout all phases by the construction companies. Moreover, proper operation and maintenance was also ensured.

b. What types of guarantees is provided and who provides them?

The individual engineering and design firms guaranteed the performance that the school would be operated to achieve the energy consumption of a passive house. The guarantee has been given to the building department of the city Frankfurt and formulated according to VOB guidelines[9].

The duration of guarantee is mainly for 4 years and it includes all sorts of guarantee from installation to proper operation until the end of guarantee period. When it is over, the city Frankfurt takes care of the responsibility of proper operation of the project.

8. ORIGIN OF GUARANTEES?

How are the guarantees originated?

The guarantee is mainly originated between the city of Frankfurt and the engineering and construction firms responsible for sustainable construction of individual components. It is prepared according to the VOB guidelines. A legal guarantee is formulated at the beginning of the project, i.e. during the preparation of the job contract.

9. FOLLOW-UP IN CASE OF CLAIMS

a. How are the claims followed up?

Within the first 4 years of the guarantee, the claims (repair, replacement, etc) due to damage are assured according to the VOB guidelines. The consulting and engineering firms generally have to provide financial security (5% of the contract volume, e.g. through a bank) for the 4 years of guarantee period. Moreover, they are legally bound to insure themselves with insurance companies so that if any damage occurs, insurance claims can be made.

Generally, the city of Frankfurt has no insurance of its own (city itself is a self insurer). Therefore, after the guarantee period, the city has to either replace or repair the damaged component by itself.

b. Who takes care of it and under which condition/limits?

All sorts of responsibility are formulated according to the VOB guidelines.

c. How clear is the responsibility formulated in contracts?

It is clearly explained.

[9] *Vergabe- und Vertragsordnung für Bauleistungen* (VOB - contracting rules for award of public works contracts) jurisdiction is prepared and updated by the *Deutsche Vergabe- und Vertragsausschuss für Bauleistungen* (DVA - German award and contract for works committee). VOB is a generally accepted as the basis of contract in the construction industry. It is neither law nor regulation, but a set of rules to which the contract in the award of the works can relate. All public construction works must be carried out according to the VOB rules.

d. Did you experience any problems so far? If yes, what kind and how did you deal with it?

No problems regarding responsibilities have occurred so far in this project. But in general, problems on responsibility occur very often. They are solved by discussing with the responsible construction firms. When it is hard to reach to a decision, an external expert evaluates the damage and tells who is responsible for what. Sometimes, the costs are shared among the related companies, e.g. 50% - 50% basis.

e. What kind of other problems could be relevant for you, if any?

The guarantee is not a very useful instrument. For example, if the company is bankrupt, no one takes over the responsibility and the city has to repair the damage and pay the costs. Even if the company has had insurance for this purpose, the liability of the insurance expires with its client's bankruptcy.

10. SUBSIDIARY QUESTION TO INSURERS (THROUGH COMPANY CONTACT)

a. How are specific risks associated to sustainable solutions assessed?

The insurance companies do not reveal their method of assessing the risks of sustainable construction. Generally the experts in insurance companies have their own risk parameters for different risk objects to calculate the risk.

However, the responsibilities concerning any risks of damage lay on the concerned company during the first 4 years; afterwards, the city Frankfurt is responsible for any risk.

b. How are claims analysed?

During first 4 years, sustainable construction companies prepare insurance contracts with the insurance companies regarding any damage and corresponding claim. The methods of claim assessment are not revealed, kept as a business secret. After 4 years, when the company liability is over, the city Frankfurt employs relevant experts to analyse the claims for any damage occurred to the corresponding sustainable construction work.

c. Are these analyses disseminated to professionals? (reference to the French « sycodes »)

Yes, everything is documented, minuted and accumulated.

d. How? (database, publications …)

It is done in the form of reports.

11. CONDITIONS ASSOCIATED TO GUARANTEES

a. Starting point

The starting point of conditions associated with the guarantee depends on the concerned construction, the contract specifications as well as the VOB specification. Generally, both the representatives of city Frankfurt and the concerned companies go to the project location and check if everything is in order or not (acceptance of construction work). If something does not work, it needs to be repaired. Everything is minuted. After the agreements of both parties, the guarantee starts from that day or from other specific date.

b. Duration

4 years for sustainable construction parts.

c. Scope/exclusion

- Everything related to the construction is generally guaranteed.
- Probably fire hazard is not guaranteed and is subject to its own insurance.
- The city office ensured the Education Authority of Frankfurt that the overall performance of the building would be maintained for about 30 years.
- When city Frankfurt itself acts as a design firm, it has an insurance for any planning failures

d. Cost

Cost of guarantee depends on the VOB guidelines. They are not usually disclosed, each construction company has its own financial plan or strategy of dealing with insurance issues. Yet, they are not bound to publish it before city Frankfurt.

12. OTHERS

- Quality is mainly assured according to the VOB guidelines. Guarantee does not help a lot in assuring quality, although it is tried to maintain in all steps of the project.
- Sometimes within the guarantee period, if the construction company goes bankrupt, there is no one to take the responsibility of damage. For example, in this project, the construction company for the windows went bankrupt two years after the installation. But in the third year, it was discovered that on one floor of the school the company had installed different kind of glasses which did not meet the national security regulations. As the glass company was already behind schedule at that time during the constructions, the incident was not correctly tracked to meet some important deadlines. While the glass company has not been able to take the responsibility any more, the city itself has had to replace the windows.
- The craftsmen involved in the project were trained in an apprenticeship and they were employed according to the VOB specifications and standards.

CASE STUDIES

Liability and insurance regimes in the construction sector. National schemes and guidelines to stimulate innovation and sustainability

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CASE STUDY 1: INNOVATIVE ENERGY SAVING BUILDING

1.1. Description of the project

The Innovative Energy Saving Building (henceforth IESB) is located in Katowice, in the centre of Silesian industrial area. IESB is a part of newly built Industrial Park that replaced the old industrial buildings.

The IESB project is primarily aimed at reducing energy usage. To achieve that, the investor decided to implement several solutions:

***Geothermal heat pump and heat exchanger*:** The heat for the building is provided by the earth hot water pump. IESB utilizes 4 wells. Each of them is 18 meter deep. At this depth, there are deposits of water of about 12 Celsius degrees temperature. During the heating season, the water is heated to the temperature ranging from 22 to 28 Celsius degrees, which guarantees low energy requirements of the entire system. In summer, the water is brought to the building by the heat exchanger, passing over the pump. The final water temperature in summer ranges from 15 to 19 degrees and is sufficient to cool the building down for most of the days. The heating power of the pump is 92 kW.

***Concrete core temperature control (Betonkerntemperierung – BKT) heating and cooling system*:** The warming water drawn from the ground is distributed to the building through the coil built into the ceilings. The same mechanism renders cooling the building down in the summer. Additionally, the heat distribution system utilizes the properties of thick ceilings (reinforced concrete slabs are 30 cm thick) and walls to heat the building in the winter and support cooling in the summer.

***Efficient external insulation and energy saving windows*:** External walls of IESB are insulated with 20 cm foamed polystyrene layer. The roof is covered with 30 cm foamed polystyrene layer and the floor is insulated with 15 cm polyester layer. In addition, the building utilizes passive windows of 0,5 W/m^2K insulation coefficient.

***Ventilation system with heat recuperator*:** IESB utilizes mechanical ventilation system. The installed heat recuperator allows regaining 75% of the discharged air heat.

***Façade external window blinds*:** The western and southern windows of IESB are equipped with automatically regulated blinds. The blinds are unrolled after an assumed solar exposure threshold is reached. The blinds are automatically lifted when the wind is too strong. The system of blinds supports maintaining the desired temperature inside the building.

***Building Management System (BMS)*:** The energy saving devices are controlled by BMS intelligent heat management system, aiming at permanent optimization and control of energy usage. The system is connected to temperature sensors in the building and decides to warm up (*resp.* cool down) the building anytime it is needed. During the weekends and holidays, the BMS system hibernates the building, by closing the ventilations system in the empty building. This minimizes heat wastage.

Additionally, IESB utilizes the building's structure and position to provide optimal thermal characteristics. Its compact architecture renders the wall/room size relation very favourable. The building has atria design and its centre is light up due to the roof light. All of the office rooms have the access to daylight.

The building does not have central heat boiler and air conditioner.

The total amount of energy needed for building's heating is 32 kWh/m per year – that is 1/3 of the energy used by traditional buildings of similar size.

IESB is a three-storied building of total area amounting 2404 m^2. The expected number of people working in the building is 150.

IESB is based on the WEIZ II building, located in Weiz, Austria, maintained by the Energy and Innovation Centre of Weiz (Weizer Energie-Innovations-Zentrum, henceforth WEIZ). The IESB project investor has been a partner of WEIZ for several years. The investor's representatives took part in research and seminars carried out in WEIZ institute. The WEIZ II building documentation was bought and was adapted to fit the local environmental and legal conditions.

The original WEIZ II project was modified in several ways. WEIZ II building used energy efficient natural ventilation system, without heat recuperation. This solution was unavailable for the IESB stakeholders, since Polish law requires that all buildings of the IESB size have mechanical ventilation system.

Also geological properties of the area forced the project developers to modify the assumptions of the original WEIZ scheme. The Industrial Park in Katowice lies in the Klodnica Fault [*Uskok Kłodnicki*] zone, where geological layers are slipping 50 meters under the ground. That rendered the implementation of original WEIZ II geothermal heating system (10 100-meter deep boreholes) impossible.

The Industrial Park project was aiming at revitalization of degraded industrial areas. The park replaced the chemical devices manufacture "Wimach". The design of all the buildings (including IESB) yields the climate of traditional industrial architecture of the place. 7 out of 10 buildings utilize the structures of previously existing industrial halls.

In the IESB project one of the investor's most vital objectives was showing that energy saving building can be built at the cost comparable to the cost of traditional office buildings. IESB's total cost was 10 437 000 Zloty (about 2 570 000 Euro[1]). According to the investor's estimation IESB was about 10% more expensive than traditional buildings of its size.

[1] All euro equivalents are estimated for the exchange rate of December 2009.

IESB and the Industrial Park are part of broader project, aiming at creating infrastructure and background for the development of energy saving technologies in Silesia. Apart from the Industrial Park, the investor has created the Energy Saving Construction Cluster. In 2010 – 2012 the investor is planning to implement the Science and Technology Park project.

The office space in IESB is offered for seats and laboratories of innovative construction sector firms. Among these firms, there are general building construction companies, developers supporting renewable energy sources, design agencies and IT companies providing solutions for industry. Additionally, professional training concerning implementation of energy saving technologies is offered to construction professionals. IESB's solutions will be a subject of research aimed at testing the implemented technologies in Polish weather conditions and investor is also planning to build passive building, using 15 kWh/m² of energy. The passive building will be the seat of the Science and Technology Park.

IESB was built between March 2007 and November 2008

1.2. Who is at the origin of the project?

Investor: Euro-Centrum Group [*Euro-Centrum Sp. z o. o.*] – a company focusing on creating infrastructure for the development of energy saving technologies in Poland

Architect: Sławomir Kostur

Design Agency: Projekt Grupa Sp. z o. o.

Key Contractors:

I. INVESTDOM Sp. z o. o.
II. Consortium: Eltrans Instalacje Sp. Z o. o. and P. P. U. H. Elektropol

Funding Agency: European Regional Development Fund. The investments was co-financed by the Fund within The Sectoral Operational Programme "Improvement of the Competitiveness of Enterprises", years 2004-2006 (Action 1.3 - Creating Favourable Conditions for Business Development). The investor received 5,9 million Zloty (about 1,5 million Euro) subsidy for IESB project. This was expected to cover 77,5% of total

investment cost. However, the significant rise in construction prices in Poland between 2006 (when initial investment estimations were made) and 2008, caused by construction investment boom, forced the investors to considerably increase their own contribution (up to appr. 50%).

1.3. Regulations, incentives, expected income and other factors of the project

The possibility of gaining the EU subsidy was an important incentive for the investor. The subsidies supporting creating infrastructure for new technologies' development influenced the idea of building the Industrial Park. The investment's location also played an important role here, since projects involving revitalization of degraded industrial areas were preferred in the Sectoral Operational Programme.

The knowledge gained during the cooperation with the investor's European partners, notably WEIZ, determined the investor's decision of engaging particularly in energy saving technologies. Additionally, expected rapid growth of energy saving and sustainable construction market in Poland was taken into account by Euro-Centrum Group.

The projects within Sectoral Operational Programme "Improvement of the Competitiveness of Enterprises", years 2004-2006 were implemented according to the *n+2* rule. This implied that the IESB project, selected in 2006, had to be finished by the end of 2008. The relatively short implementation period made it impossible to fully engage the broad assistance of WEIZ technical experts.

Legal regulations concerning buildings' ventilation system properties had the direct impact on IESB's final form. The original WEIZ II building's natural ventilation system had to be replaced with mechanical one (see: *Description of the project*). However, the implementation of heat recuperation system is expected to guarantee improvement of building's energetic characteristic.

The projects' stakeholders expect that energy saving solutions applied in IESB will guarantee reduction of the building's operation cost during its life cycle. However, direct financial savings were not the crucial determinant of the project.

1.4. Administrative authorisations required

The procedure of gaining administrative permissions in the IESB project was a standard procedure applied in Polish construction sector. According to Polish Construction Law, to gain a building permit, an investor is obliged to present an application form and a building design. The design must be explicitly approved by the respective construction specialists. Additionally, a confirmation of design engineer's (architect's) valid professional license is required. The building permit is issued by the poviat starost [*starosta powiatowy*].

In IESB case, the building design had to be approved by 2 constructors, 2 architects, 2 fitters, 3 assessors and 2 electricians. Before approving the documentation, each of the professionals is obliged to analyze and control it. Each of the professionals is legally responsible if the design element that she/he approved turned out to be defective. This creates a mechanism protecting clients against possible building design defects.

1.5. To which kind of information does the developer have access before launching the project? The sources of the information.

Before launching the project the investor based primarily on the technical documentation provided by the WEIZ institute. The WEIZ technical documentation covered the expected properties of BKT ceiling heating system, external insulation and intelligent BMS heat management system. The information was considered reliable, since WEIZ II building's energetic properties were subjected to extensive measurement carried out by WEIZ institute experts. In addition to the cooperation with WEIZ institute, the investor was collecting data about energy saving technologies during a series of meetings with its partners in the Germany.

The possibility that the building's energetic characteristics in Polish weather conditions can be slightly different from the original Austrian conditions was taken into account by the investor. However, since the technologies used in IESB have not been used in office buildings in Poland so far, the investor had to accept the risk. The investor decided to install complex measurement apparatus and engage scientists (notably from AGH

University of Science and Technology [*Akademia Górniczo-Hutnicza*] in Cracow) to carry out detailed research on efficiency of the applied technologies.

Independently of the WEIZ II building documentation the investor had also the access to the technical documentation of heat recuperation system (not present in WEIZ II building).

Another important piece of information the investor searched for was data about investment cost and the expected payoff, resulting from application of the energy saving solutions. Here the investors relied on their own estimations, concerning the expected energetic characteristics of the building and the expected dynamics of traditional energy prices in Poland. Also the experience gathered during previously implemented projects (mainly the Industrial Park) played a significant role in estimating the investment's cost.

Detailed knowledge of the geological properties of the area was also vital for the project's success. To gain that knowledge, the research on ground water deposits was ordered.

1.6. Guarantees

The guarantee scheme applied in the IESB project was a standard scheme, applied for most projects supported from public resources and EU subsidies.

The investors demanded that each contractor deposits a proper contract execution security. For each contractor, the security's worth amounted to 5% of contract worth. According to the contract agreements, the security, in each case, covers investor's losses caused by contractors' improper execution. Contractually specified fines are also covered by the security.

Irrespective of the security, an investor can make a claim for vindication of actual losses.

After construction works' completion, 3-year's obligatory quality guarantee periods (starting at the reception) were established. The investor held 30% of initially received securities, as a form of guarantee cover. After the 3-years' period, the investor is obliged to return the deposited security to the contractors.

The architect (design engineer) guarantees viability and good quality of the design. If any defects of the design are discovered during construction works, the architect is obliged to correct the design in a 2-weeks' period. The architects' guarantee period was set to 4 years, on the basis of the contract agreement between the investors and the architect. The architect (design engineer) is also responsible for hidden design defects that occur after the building works are finished. The architect's guarantees are covered by deposited security (5% of the contract worth) and professional liability insurance.

Requirements concerning contractor's and design engineer's experience were also specified. The investors did not require that contractors prove experience exactly in technologies they planned to implement, since too few contractors could be able to do it. Therefore, the investors demanded only that contractors were able to prove their experience in implementing *relevantly similar* projects.

The contractors were also obliged to present valid civic liability insurance policies and construction all risk (CAR) insurance policies. CAR insurance policies covered damages and losses of any property engaged in project implementation process during the construction works' period. Civic liability insurance covers third party damages caused by construction works.

1.7. Origin of guarantees

The above scheme is strongly dependent on legislation framework in Poland. The Public Procurements Law demands that most contractors, including architects/project engineers, must deposit a security. Contractors can choose between leaving a bank guarantee (most popular), insurance guarantee or cash. The Public Procurements Law implies that, for each contract, the worth of security ranges from 2 to 10 percent of contract's worth. According to the Public Procurements Law, a security covers investor's claims in case of improper contract execution caused by contractor. Also, investor's losses caused by delays and improper execution are covered. After construction works are finished, the security left by contractor serves as a cover for quality guarantee. For this purpose, an investor can hold not more than 30 percent of initially taken security.

The Public Procurements Law demands that all contractors must be able to prove relevant experience. However, the Public Procurements Law does not specify details of the experience that must be possessed for particular kinds of projects.

The minimum length of quality guarantee for buildings is set to 3 years by Polish Civil Code. Additionally, the Civil Code sets a framework for design engineers' and architects' professional liability. At the minimum, design engineers and architects are obliged to provide unconditional *ipso iure* 3-years' warranty [*rękojmia*]. Additionally, architects and design engineers are responsible for any damages caused by design's defects that occur during the building's functioning. The same holds for hidden mistakes committed by other contractors.

Architects and design engineers are obliged to possess professional civic liability insurance policies. These policies are covering claims caused by architects' mistakes within a specified domain of independent engineering. The minimum worth of architects'' civil liability insurance is set to 50 000 Euro.

The mandatory insurance covers claims addressed personally to the engineers. The claims addressed to design agencies are not covered. Design agencies, considered as firms, are not obliged to possess insurance policies. However, many of the design agencies possess voluntary professional liability insurances policies for firms.

The procedure of gaining building permits establishes an additional protection against design defects (see a section on administrative authorisations).

The contractors'' civic liability insurance and CAR insurances are not mandatory in construction projects supported by public resources. However it is a widespread practice that investors impose the conditions on contractors. Building contractors often possess civic liability insurance of the abovementioned sort even if it's not required by investors.

1.8. What is the follow-up in case of claims?

Guarantee claims in the IESB project can be set up during the guarantee period, starting form the building's delivery date,

In case of any defects, the investor's representative (investment supervision inspector) determines the cause and sets up a claim (in writing) to a respective contractor. The contractors are obliged to start repair work not later than 7 days after receiving a claim. In case of any delays, the contract fines must be paid. If a contractor does not carry out the repair works, the investor can commission it to a third party and charge the

contractor for that. A part of the deposited security is taken over by the investor, if a contractor refuses to pay for the third party's repair works.

In case of design's defects, the architect is obliged to correct the documentation in 14 days. If the defect is discovered after the building's delivery, and thus cannot be corrected, then the architect may be responsible for possible investor's losses. The insurer is obliged to cover the claims if they cannot be satisfied by the architect.

The professionals who approved the design before a building permit was given can also be held responsible for the design's defects.

If a contractor/architect does not plead guilty and refuses to carry out the repair works, then the investor can mandate an expertise. The case is then taken to court if both sides do not come to an agreement. The court mandates an ultimate expertise.

CASE STUDY 2: COMPLEX THERMOMODERNIZATION OF CHILDREN'S REHABILITATIVE HOSPITAL

2.1. Description of the project

The Voivodeship Rehabilitative Hospital for Children in Ameryka is an independent, public healthcare institution, specialising in children's lungs diseases treatment. The Hospital is located in Warmia-Mazury Voivodeship woods, in Olsztynek poviat, on Pasłęk Lake.

The Hospital's administrators, benefiting from several different subsidies, decided to implement projects aiming at improving energetic and thermal characteristics of the Hospital's buildings.

Initially the hospital installed solar hot water heating system, providing hot water for rehabilitative (hydrotherapy) and sanitary needs. The collectors of 320 square meters were installed. The 200 kW power, that they produce, is heating 16.5 thousand litres of

water, located in hospital's tanks. In summer, the collectors completely satisfy the needs of the Hospital's hydrotherapy and sanitary units.

As new funds were raised, the hospital administrators decided on implementing new, more complicated project of complex thermomodernization.

The complex thermomodernization project itself consists of 3 stages. The construction and assembly works done in the first stage included: installation of heat pump, installation of new ventilation system implementation the heating and cooling system for ventilation units. Additionally, the electrical system was upgraded in this stage.

The second stage of the investment included assembly of external insulation for the Hospital's building. For this purpose, 20 cm layer of mineral wool and 10 cm foamed polystyrene layer were used. The mineral wool layer covered 80% of the Hospital's building's external walls' area.

The third stage will involve installing heat exchangers that recover heat from the ventilation system and 2 exploited central heating boilers will be replaced with new, efficient ones. Additionally full automation of the entire building's heating system will be implemented. A new heat management system will control and coordinate solar hot water heaters heat exchangers, boilers and ventilation system.

All the investments are aimed at reducing the energy consumption of hospital's facilities. Especially, the solar hot water heater plays an important role here, since the hospital uses needs a large quantity of hot water for hydrotherapy. All the projects carried out by the hospital are expected go guarantee 40% reduction of the amount of energy consumed for building and water heating.

Reduction of pollutants' emission is also a key determinant of the project. The hospital is located in ecologically clean area (Pasłęk Lake) and the treatments it offers often exploit the therapeutic properties of the environment. Improving air quality is important particularly for patients suffering from respiratory ailments, and allergies. The new ventilation system is also important for patient's health, since the previously existing inefficient gravitational ventilation was believed to be harmful for young patients.

The solar hot water heaters installed on the hospital costed 850 000 Zloty (about 210 000 Euro). 420 000 Zloty (about 103 450 Euro) of the sum was provided by external

funding agencies. The rest was financed by the hospital's own budget and commercial loans.

The total cost of the complex thermomodernization (3 stages) amounts to 747 000 Euro about 4 million Zloty). The project was awarded with European Economic Area grant, amounting to 634 917 Euro.

The solar hot water heaters were installed in late 2005 and 2006. The complex thermomodernization project's documentation was prepared in 2004. The project is still in progress. Its second stage was finished 31 October 2009. The Hospital's administrators are now preparing bidding for third stage general contractor. The complex thermomodernization is expected to end until September 2010.

2.2. Who is at the origin of the project?

Investor (beneficiary): The Voivodeship Rehabilitative Hospital for Children in Ameryka

Architect: Romulad Szafranowski: Design scheme for all stages of the thermomodernization.

Design agency: Probud Sp z. o. o.

Contractors:

I. „Polterm" Przedsiębiorstwo Realizacji Inwestycji Przemysłowych i Ciepłowniczych Sp. z o.o, Stawiguda: general contractor of the first stage of the investment
II. Przedsiębiorstwo Budowlane "Witka" Krzysztof Krawczyk, Olsztyn: general contractor of the second stage of the investment

Funding agencies:

The solar hot water system was in largest part financed by the "Ecofund" Foundation [*Ekofundusz*] - 320 000 Zloty (about 78 829 Euro) was provided. Nearly 100 000 Zloty (about 24 630 Euro) was provided by the Voivodeship Fund for Environmental Protection and Water Management [*Wojewódzki Fundusz Ochrony Środowiska i Gospodarki Wodnej*].

The complex thermomodernization project was in 85% financed by the European Economic Area grant (Norwegian Financial Mechanism). The remaining part was financed by the Warmia–Mazury local self-government. The EEA grants were distributed by the National Fund for Environmental Protection [*Narodowy Fundusz Ochrony Środowiska*] and the Ministry of Environment [*Ministerstwo Środowiska*] (intermediate bodies). The support received form the EEA grants is non-returnable.

2.3. Administrative authorisations required

At the beginning of the complex thermomodernization project, the mandatory feasibility study was prepared. The study was analyzed by the funding agency, during the consideration of the Hospital's application form.

After the subsidies were granted, standard procedure of getting administrative building permits was applied. The detailed design of all the project's stages was prepared on the basis of the assumptions included in the feasibility study. The project design was then approved by the investor and by the respective construction professionals in order to gain building permit. The project design has to be approved also by the contractors selected in biddings.

The funding agencies' requirements were a factor that complicated the procedure of obtaining building permits. The representatives of Norwegian Financial Mechanism' Intermediate Bodies demanded that all components of the particular stages of the thermomodernization project were approved by the Poviat Construction Inspectorate [*Powiatowy Urząd Nadzoru Budowlanego*] (normally, this requirement does not apply to all elements of construction process). Documents confirming the notification of subsequent components had to be sent to the Intermediate Institutions. Strict compliance with the feasibility study assumptions concerning ecological properties of the building and quality of the materials used was also demanded by the donors to a Polish specialized company.

Moreover, given the historic nature of the over 100-year-old hospital buildings, the particular stages of the construction process had to be approved by the Voivodeship Heritage Conservator [*Wojewódzki Konserwator Zabytków*]. Hospital administrators had to obtain additional permits for assembly of most of the planned items from the conservator. Voivodeship Heritage Conservator's requirements have significantly

influenced the shape of the project. Given these requirements, solar hot water heaters could not be installed on the main hospital's building. They were installed on a newer building, which is not part of the historic hospital. Due to the Heritage Conservator's requirements, investors could not use Styrofoam insulation and plastic windows.

Requirements posed by the Heritage Conservator increase the cost of construction work in the hospital buildings. On the other hand, the Hospital's administrators claim that the historic nature of the complex facilitates rising of external funds.

Funding agencies of complex thermomodernization project, conduct regular controls of the project's objectives implementation. The expenditure and timely delivery of work are also subjected to controls. Hospital administrators are required to submit the annual project implementation reports to the Intermediate Bodies.

Since the beginning of the project implementation, representatives of the Norwegian Financial Mechanism, conducted two inspections in the Hospital. The other two inspections have been carried out by representatives of Intermediate Bodies. The inspections didn't show any incorrectness.

According to the participants in the project, the consequences of nonconformities detected by the representatives of the Norwegian Mechanisms can be very painful for the investor. In case explicit nonconformity to the original assumptions (for example, in case of low renewable energy sources' efficiency), the investor is threatened even with repayment of the grants.

The implementation of the complex thermomodernization project is also controlled by the Voivodeship Heritage Conservator. In this case, the consequences of possible nonconformities usually are not very severe for the investor and come down to making appropriate modifications in construction works.

2.4. To which kind of information does the developer have access before launching the project? The sources of the information.

Feasibility study, commissioned to external consultants, was the primary source of the investor's information on the expected properties of the building. This study included

detailed analysis of the current thermal characteristics of the object (based on energy audit) and the results of the implementation of the new solutions.

Applications for Norwegian Financial Mechanism's funds must include risk factors' analysis. Risk factors were identified by investors, while detailed analysis of each of them was commissioned to external consultants. According to the Hospital's representatives, instability of prices on the construction market was significant threat for the project's feasibility. Also Euro-Zloty exchange rate fluctuations could be very unfavourable. The fluctuations are dangerous to the project because, in the mentioned cases, the donors do not agree to grant additional funds. Application forms mentioned also the possibility final nonconformity with the objectives of the project caused by particular contractors' errors.

According to the Hospital's representatives, the mandatory design approval procedure (prior to obtaining the building permit) was an important factor that assured them of the technical feasibility of the project. This procedure is important due to the fact that a construction professionals' approval of the design, makes them responsible for the design's quality. Another factor securing the Hospital's was an analysis the project's design performed by the contract engineer (that is a construction professional supervising the project from the investor's side).

2.5. What is guaranteed at the end of the project?

On each stage of the project implementation, contractors guaranteed the quality and lack of physical defects in the work they performed. For most of works, 3-years' obligatory guarantee was established. Regardless of the guarantees provided by the contractors, the installed devices (e. g. the het pump) are also covered by the manufacturers' guarantees.

In the second stage of the thermomodernization project (external insulation) the annual review and control of the insulation's condition (based mostly on visual inspection) was also within the scope of the guarantee obligation.

The project design is covered by mandatory warranty concerning its compliance with applicable laws and principles of building.

The investor demanded that contractors insure the construction site. This insurance protects the investor and the contractor against claims of third parties, who may suffer in consequence of the construction works.

The general contractors were obliged to deposit 10% of the contract's values as a form of proper contract execution security. On receipt of the work, the investor held 30% of the initially received bonds, as a security of proper execution of guarantee works.

2.6. Origin of guarantees

The system of guarantees and securities applied in the project is directly implied by the requirements of the Public Procurement Law and the Civil Code. The Public Procurement Law determines the requirements for deposited securities and contractor's competence. Quality guarantees, as well as engineers' professional liability are governed by the Civil Code (see chapter 1.7).

2.7. What is the follow-up in case of claims?

In case of errors caused by the contractors, the investor may require them to carry out appropriate modifications. In case of the contractor's nonconformity with the agreement, the investor is entitled to retain the security deposit (equal to the damage suffered).

The same applies for guarantee claims. Defects are reported to contractors who, within the prescribed period, shall be required to carry out the repairs. In case of contractors' failure to comply with the guarantee obligation the Hospital can the repairs performed by a third party, at the expense of the guarantor. If necessary, repairs under warranty are financed from funds deposited by the investor.

If the parties fail to agree on the causes of occurring failures, they may refer to court. However, the interviewed contractor claims that, in the case of minor repairs, many contractors decide to satisfy warranty claims, even if the question of failure causes is not finally answered. Thus lengthy trials are avoided.

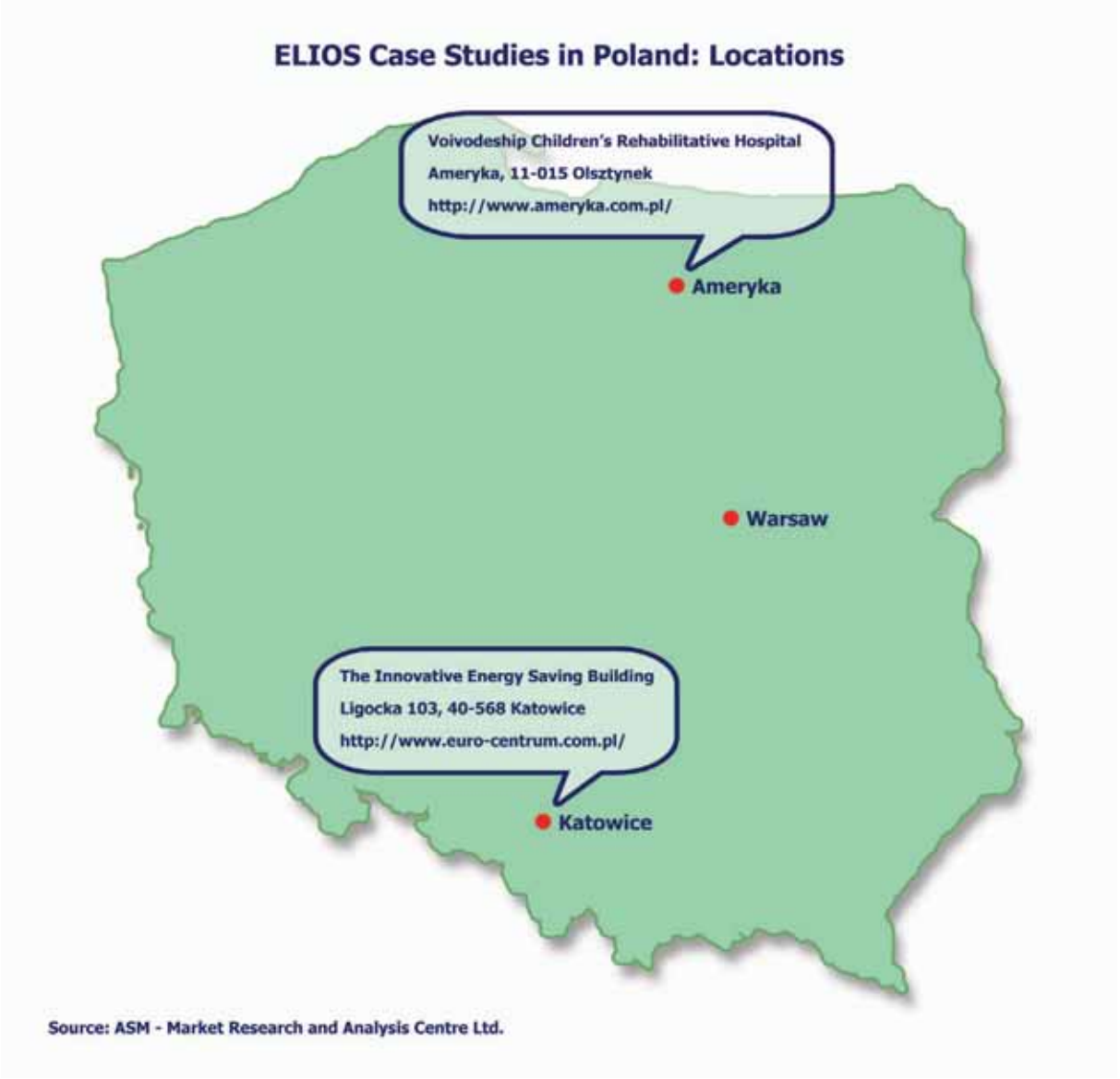
If design defects are detected (for example, if it fails to comply with the applicable law), the investor may require the design engineer (architect) to amend the design. If there

are hidden defects in the project, the investor can demand a redress through lawsuit. The compulsory design engineer's insurance is used when the designer does not meet the claims.

The risk of failure to comply with the initial design assumptions (for example, not achieving the expected energy performance of the building) can be a problem for investors. This problem stems from the fact that if there is a difference between the feasibility study assumptions and the final results, the study can not be subjected to a guarantee claim. In case of incorrect implementation of a feasibility study, Hospital's representatives envisage setting up claims against the authors of the feasibility study, through lawsuit.

The Hospital's representatives suggest that carrying out the mandatory risk analysis (before filing the application form) may, at least partially, protect investors against loss of funds caused by non implementing the project's objectives. In addition, the fact that the submitted feasibility study was accepted by the funding agency representatives can advocate them. However, it is unclear whether the mentioned procedures create any mechanism allowing the investor to avoid losing the grants.

LOCATIONS OF THE BUILDINGS



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ANNEX II - Schemes and good practices

Liability and insurance regimes in the construction sector; national schemes and guidelines to stimulate innovation and sustainability, Final report 30 April 2010

Country	Technical evaluation and assessment of innovative solutions	Cover of latent defects /Housing warranties	Monitoring construction deficiencies and prevention	Promoting high professional standards	Promoting sustainable development	Clients support and advice
Austria				Austrian Standards Institute (ÖN)		
Denmark		Danish Building Defects Fund Building Damage Fund for Urban Renewal	Danish Building Defects Fund Building Damage Fund for Urban Renewal	The Benchmark Centre for the Danish Construction: - key performance indicators system, - register of construction firms		
Finland			FISE: - register of construction defects	Confederation of Finnish Construction Industries (RT): - register of quality construction firms		
France	CSTB: - Avis Technique - Appréciation Technique d'Experimentation (ATEX) ETN (Enquête des Techniques Nouvelles)		Agence Qualité Construction: - Monitoring, prevention and diffusion of information on construction defficiencies	Qualibat, Qualifelec, Quali-PV, OPQIBI …- qualification of construction and engineering firms, MPRO-Architecte – qualification of architectural practices, QUALIMO – qualification of public housing organisations, QUALI-PROM – qualification of private property developers (see « Inventaire des signes de qualité dans la construction », AQC- décembre 2009) Certivéa – certification of buildings in terms of conformity to best environmental practice	Pass Innovation (CSTB): Accelerated procedure of innovative products assessment entering into the scope of the law "Grenelle de l'environnement"	
Germany		SVM GmbH	*Fraunhofer-Informationszentrum Raum und Bau* (IRB): - online database of construction defects (SHADIS) Institute for Conservation and Modernization of Buildings (IEMB)	German Institute for Standardisation (DIN) *Deutscher Vergabe- und Vertragsausschuss für Bauleistungen* (DVA) – public procurement procedures		*Kostengünstig qualitätsbewusst Bauen* *Verband Privater Bauherren* (VPB)
Greece					Centre for Renewable Energy Sources (CRES)	
Ireland	Construction Quality Assurance Ireland (CQA)	National House Building Guarantee Scheme (Homebond)				

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The Netherlands		Bouwfonds, SWK, Woningborg (GIW Institute members until 31.12.09) BouwGarant	*Bouwend Nederland:* - quality label for builders - monitoring of construction disorders	Dutch Normalisation Institute (NEN)		
Poland				General Office of Building Control Developers certificate		
Portugal			Common Information Network (RTIC): - registration and processing consumer complaints *Observatório das Obras Públicas:* - monitoring of execution of public procurement projects	Protocol for the Standardization of Information Technology in Construction (PRONIC) Office of Construction and Real Estate: - register of certified builders Portuguese Construction Technology Platform IcBench project: - benchmarking and self assessment system		
Romania					Romanian Green Building Council	
Slovenia				Slovenian Construction Technology Platform		The Energy Advisory Network for households
Spain				Spanish Quality Association (AEC) Technical Code for Construction (CTE)	Institute for Diversification and Saving of Energy (IDAE)	
Sweden		AB Bostadsgaranti GAR-BO AB	Boverket Institute: - monitoring of construction defects			
United Kingdom	Microgeneration Certification Scheme (MCS)	National House-Building Council (NHBC)	National House-Building Council (NHBC)	TrustMark: - quality label for builders	Zero Carbon Hub	

ANNEXE III - CONTACTS

Liability and insurance regimes in the construction sector; national schemes and guidelines to stimulate innovation and sustainability
Final report 30 April 2010

ORGANISATION	NAME	COUNTRY
AB Bostadsgaranti Residential Warranties Insurance Company Ltd.	Kåre ERIKSSON Kjell JUTEHAMMAR	**Sweden**
ACE Architect's Council of Europe	Adrian JOYCE Alain SAGNE	**EU**
AEHWO The Association of Home Warranty Organisation	John HAYNES Lewis SIDNICK	**EU**
AIDA International Association of Insurance Law	Torben BONDROP	**Denmark**
AIDA International Association of Insurance Law	Jerome KULLMANN	**France**
Allen & Overy Luxembourg	Dominique BORNERT	**Luxembourg**
Allianz Țiriac Asigurări S.A.	Elena-Cristina POCOVNICU	**Romania**
Andreas Neocleous & Co LLC	Christos VEZOUVIOS	**Cyprus**
AQC Agence Qualité Construction	Marc DUCOURNEAU	**France**
Architect & Civil Engineer Building Regulations Office	Josianne VASSALLO	**Malta**
ASFP Association for Specialist Fire Protection	Bill PARLOR	**United Kingdom**
Association of Building Entrepreneurs in the Czech Republic	Pavel NOVAC Jiri SKALA	**Czech Republic**
Atelier Jens Freiberg	Jens FREIBERG	**France**
Baloise	René BECK	**Switzerland**
Balto Link	Nerijus JAKIUNAS	**Lithuania**
BBA British Board of Agrément	Joe BLAISDALE Greg COOPER	**United Kingdom**
BBRI Belgian Building Research Institute	Eric WINNEPENNINCKX Peter WOUTERS	**Belgium**
Beiten Burkhardt	Paweł KUGLARZ	**Poland**
BDB Bund Deutcher Baumeister, Architecten und Ingenieure e.V.	Herbert BARTON	**Germany**
BIngK Federal Chamber of German Engineers	Joachim JOBI	**Germany**
BIPAR The European Federation of Insurance Intermediaries	André VAN VARENBERG	**EU**
Bouwunie The Flemish Federation of the SMEs of Construction	Marc-Antoine LEMAIGRE Nadia SCHEPENS	**Belgium**
Bulgarian Construction Chamber	Velyana TOPALOVA	**Bulgaria**
CACE Czech Association of Consulting Engineers	Jaromir KACENA	**Czech Republic**
CAPEB La Confédération de l'Artisanat et des Petites Entreprises du Bâtiment	Annie-France LOGEZ	**France**

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Liability and insurance regimes in the construction sector; national schemes and guidelines to stimulate innovation and sustainability
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ORGANISATION	NAME	COUNTRY
CCA Czech Chamber of Architects	Dita PAVELKOVA	**Czech Republic**
CEA European Insurance and Reinsurance Federation	Carmen BELL Sandrine NOËL	**EU**
CEBC Consortium of European Building Control	Daniel BEURMS	**EU**
CECODHAS The European Liaison Committee for Social Housing	Virginie TOUSSAIN	**EU**
CEPMC Council of European Producers of Materials for Construction	Pascal BAR	**EU**
Chamber of Architects and Civil Engineers	Vincent CASSAR	**Malta**
Chamber of Commerce and Industry of Slovenia **Chamber of Construction and Building Materials**	Valentina SMRKOLJ	**Slovenia**
COBATY INTERNATIONAL Féderation Internationale de la Construction, de l'Urbanisme et de l'Environnement	Martine COETS-GAIBILI Alain JAFFRE Marie PIEDRAIT FILLIE	**EU**
CNC Confederación National de la Construcción	Martinez Marques Jose PABLO	**Spain**
DIBt Deutsche Institut für Bautechnik	Hans SEYFERT Mathias SPRINGBORN	**Germany**
Dion Toumazis & Associates	Antonis TOUMAZIS	**Cyprus**
Dutch Ministry of Housing, Spatial Planning and Environment	Karel W VALK	**the Netherlands**
EAACEC Estonian Association of Architectural and Consulting Engineering Companies	Mauno INKINEN	**Estonia**
EBC European Builders Confederation	Alice ETIENNE Tim KRÖGEL	**EU**
EC Malta Malta European Consumer Centre	Claude SAMMUT	**Malta**
ECC-Net European Consumer Centre Romania	Mihai TITICHI	**Romania**
EFCA European Federation of Engineering Consultancy Associations	Jean VAN DER PUTTEN	**EU**
EIFER European Institute for Energy Research	Syed Monjur MURSHED	**Germany**
Elevit France SARL	Jean PIA	**France**
EOTA European Organisation for Technical Approvals	Paul CALUWAERTS and national members	**EU**
EPF European Property Federation	Michael MACBRIEN	**EU**
ETEC Cyprus Scientific And Technical Chamber	Christodoulos HADJIODYSSEOS	**Cyprus**
Euro-Info-Consommateurs	Alain LAMASSOURE Martine MERIGEAU Bianca SCHULZ	**France**
Explorations architecture	Caroline BOREL	**France**

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Liability and insurance regimes in the construction sector; national schemes and guidelines to stimulate innovation and sustainability
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ORGANISATION	NAME	COUNTRY
FFACB Fédération Française des Artisans Coopérateurs du Bâtiment	Anne-Marie BECKER	**France**
FFSA Fédération Française des Sociétés d'Assurances	Annie BOUDON Pierre ESPARBES Daniel LEMAITRE Anne-Marie PAPEIX Aurianne PIERRON Claudine QUILLÉVÉRÉ	**France**
FIEC European Construction Industry Federation	Ulrich PAETZOLD	**EU**
FMB Federation of Master Builders	David CROFT	**United Kingdom**
FNTP Fédération Nationale des Travaux Publics	Marie EILLER-CHAPEAUX	**France**
Foyers de Seine et Marne	Robert GERBE	**France**
FRI Danish Association of Consulting Engineers	Ulla SASSARSSON	**Denmark**
GDV German Insurance Industry Association	Nils HELLBERG	**Germany**
GEAAC Groupement Européen pour L'Assurance des Architectes et Concepteurs	Jacques ARON	**EU**
German Construction Industry Federation	Martin FREITAG Michael WERNER	**Germany**
Hellenic Association of Insurance Companies	Maria FARANTOU	**Greece**
ITB Instytut Techniki Budowlanej	Marek KAPRON Jadwiga TWOREK	**Poland**
King's College London, Centre of Construction Law	John BARBER Philip BRITTON	**United Kingdom**
Kiwa	Rense KUIL	**the Netherlands**
Lithuanian Builders Association	Sigitas MITKUS	**Lithuania**
Lloyd's of London	James WALMSLEY	**United Kingdom**
MAF Mutuelle des Architectes Français	Jean-François ALLARD	**France**
Marsh Kindlustusmaakler AS	Mart MERE Keith POLDER	**Estonia**
Member of European Parliament	Isabelle DURANT	**EU**
Member of European Parliament	Isabelle GRELIER	**EU**
Member of European Parliament (1999-2009)	Catherine GUY-QUINT	**EU**
Member of European Parliament	Philippe JUVIN	**EU**

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Liability and insurance regimes in the construction sector; national schemes and guidelines to stimulate innovation and sustainability
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ORGANISATION	NAME	COUNTRY
Ministère de l'Écologie, de l'Energie, du Développement durable et de la Mer	Jean-Jacques BRYAS Jacques FRIGGIT Christian RENTZSCH Isabelle VAULANT Eve VINCENOT	**France**
Ministère des PME	Olivier REMACLE	**Belgium**
Ministry of Communications and Works	Alecos MICHAELIDES	**Cyprus**
Ministry of Interior	Stavros GIAVRIS	**Cyprus**
Ministry of Economics of Latvia, Building and Housing Department	Gatis ĀBELE	**Latvia**
Ministry of the Environment	Kirsi MARTINKAUPPI	**Finland**
Ministry of the Environment and Spatial Planning of Slovenia	Sasa GALONJA	**Slovenia**
Ministry of the Environment of Sweden	Giedre MATEIKAITE	**Sweden**
Munïch Re	Jean Marc RADUREAU	**France**
Muşat & Asociaţii	Mona MUSAT	**Romania**
NHBC National House-Building Council	Imtiaz FAROOKHI John HAYNES Peter JONES David KIRKWOOD David MARCHANT Lewis SIDNICK Richard TAMAYO	**United Kingdom**
FNH Norwegian Financial Services Association	Mia Ebeltoft	**Norway**
OPQIBI	Stéphane MOUCHOT	**France**
PIU Polska Izba Ubezpieczeń	Piotr Wójcik	**Poland**
Prospector Consulting Group Ltd	Robert ANDRYCHOWICZ Andrzej WĘGRZYN	**Poland**
Protect SA	Ides RAMBOER	**Belgium**
PT AECOPS Portuguese Federation of Construction and Public Works Industry		**Portugal**
QUALIBAT	Marie-Dominique MONSEGUR	**France**
QUALISPORT	Geneviève BARBASTE	**France**
RSA Royal Sun Alliance	Phil BELL	**United Kingdom**
SCOR	Jean Paul PIROG Jean TUCELLA	**France**
SCRL SECO cvba	Pianet YVES	**Belgium**

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Liability and insurance regimes in the construction sector; national schemes and guidelines to stimulate innovation and sustainability
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ORGANISATION	NAME	COUNTRY
SE Swedish Insurance Federation	Staffan MOBERG	**Sweden**
SIDIR Stowarzyszenie Inżynierów, Doradców i Rzeczoznawców	Michał PRYMAKOWSKI	**Poland**
SMABTP	François-Xavier AJACCIO Hervé LEBLANC	**France**
SPF Economie Service des Assurances	Nicolai FILIP	**Belgium**
STD Svensk Teknik och Design	Lena WÄSTFELT	**Sweden**
Stibbe Brussels	Benoît KOHL	**Belgium**
SWK Stichting Waarborgfonds Koopwoningen	Frits HORVERS	**The Netherlands**
Swiss Re	Bernard TETTAMANTI	**Switzerland**
Syntec-Ingenièrie	François BECHILLON-BORAUD	**France**
Triglav Insurance Company	Gorazd JENKO	**Slovenia**
Typsa Group	Dolores Bueno TOMÁS	**Spain**
TZUS Technical and Test Institute for Construction	Jiří SOBOLA	**Czech Republic**
UEAtc European Union of Agrément	National Members	**EU**
UEPC European Union of Developers and House Builders	Filiep LOOSVELDT Laurent WILLE	**EU**
University of Copenhagen	Ole HANSEN	**Denmark**
USG Union Syndicale de la Géotechnique	Jacques ROBERT	**France**
VBI German Association of Consulting Engineers	Klaus ROLLENHAGEN	**Germany**
Victoria	Theodoros KOKKALAS	**Greece**
VIG Czech Insurance Association	Vaclav ZIKAN	**Czech Republic**
VVO Association of Austrian Insurance Companies	Robert PLACR Irene SCHWARZINGER	**Austria**
Woningborg	Rien SMIT	**the Netherlands**
Zavarovalnica Maribor d.d.	Aleš URBIC	**Slovenia**
Zero Carbon Hub	Neil JEFFERSON	**United Kingdom**

THE SURVEY QUESTIONNAIRE

'Liability and insurance regimes in the construction sector: national schemes and guidelines to stimulate innovation and sustainability'

This survey has been elaborated as a part of a research project commissioned
by the European Commission (DG ENTR) in the framework of the lead market initiative for Europe

www.elios-ec.eu

Publication in the Official Journal of the European Union of 02/12/2008
Contract No: SI2.ACPROCE021941000

'Liability and insurance regimes in the construction sector: national schemes and guidelines to stimulate innovation and sustainability'

PART 1 - INTRODUCTION

A/ Presentation

The Objective

The objective of this research is to review the existing insurance schemes within the 27 EU Member States and to assess if insurance could stimulate innovation and sustainability in the European Union construction industry. The present feasibility study was named ELIOS as an abbreviation of European Liability Insurance Organisation Schemes.

Further information on the project can be found on the internet: www.elios-ec.eu

The Questionnaire

The questionnaire reflects the concerns of the European Commission indicated in the project's work program. It is composed of three main parts:

A/ Description of the national liability and insurance systems,
B/ Organisation, functioning and impact of construction insurance on consumer protection, competitiveness and sustainability of the construction sector and the economics of the insurance market,
C/ Identification of existing insurance schemes and good practices, or of possible developments, which could help construction companies, especially small and craft enterprises to exploit innovative solutions for sustainable development and to adopt responsible management.

Some of the questions are dedicated to describing as objectively as possible the existing situation in the Member States. Others, distinguished in the text by the coloured font, are more subjective and are intended to collect the opinions or suggestions of the market stakeholders.

Completing and returning the questionnaire

We have provided flexible answer boxes for all questions, in which we invite you to insert your comments and descriptions. Even though this document is partly a multiple choice questionnaire, it is essentially an open questionnaire dedicated to collecting as many opinions and ideas as possible.

You are invited to complete the attached survey form and return it by fax or e-mail to Monika Takuska on:

monikatakuska@cea-london.co.uk **Fax: +44(0)20 7763 7065**

To ensure the questionnaires are of most use to the ELIOS research team please complete and return them before 15 September 2009**.** If you require further assistance regarding the completion of the survey, please contact Monika Takuska (see contact details above).

B/ Respondent's details

Name

Surname .....
First Name(s) .....
Title Mr/Mrs/Miss/Dr/other .....
Qualifications (Degrees, Institutions etc) .....
Position held .....

Business Address

Name of Organisation .....
Number or name of premises .....
Street .....
Town/City .....
Postal code .....
Country .....
Telephone
Land line(s) .....
Mobile .....
Fax number .....
E-mail address .....
Organisation's website .....

Organisation

Please indicate the role of your organisation in the construction process:

.....

Country

The survey is completed in respect of (name of country): .....

If you wish to provide information on more than one country, please fill-in a separate questionnaire for each country.

PART 2 – QUESTIONNAIRE

A/ The national system of liability and insurance

1. Please give a brief description of the liability framework in your country:

   a. Common liability rules for all construction operators:

   b. Specific liability rules for main actors:

      i. Final Client (future owner)

      ii. Architect

      iii. Consulting engineer or designer

      iv. Contractor

      v. Producer of construction materials

vi. Technical auditor

vii. Property developer

viii. Other (please specify)

2. Are the liabilities of each actor above clearly defined?

3. How are these liabilities defined?

a. By legal regulations ☐
b. By contractual arrangements between parties involved ☐
c. By other means ☐

4. Can a market actor be subject to a joint liability with other participants to a construction process?

5. Is insurance mandatory for the following construction parties?

   a. Final client (future owner) ☐
   b. Architect ☐
   c. Consulting engineer or designer ☐
   d. Contractor ☐
   e. Producer of construction materials ☐
   f. Technical auditor ☐
   g. Property developer ☐
   h. Other (please specify) ☐

6. Do you consider that the insurance covers available and the premiums applied are

   a. Proportional ☐
   b. Disproportional ☐

   to the services provided by the construction market actors and to the duties, liabilities and risk they assume?

7. Which damages are covered by the insurance policies in your country?

   a. Damage to building works during construction ☐
   b. Defects of building works after completion ☐
   c. Third party's damage during construction ☐
   d. Third party's damage after completion of works ☐

8. What type of insurance is available in your country?

   a. Insurance of physical damage or first party insurance ☐
   b. Insurance of liability or third party insurance ☐
   c. Performance warranties or bonds ☐

9. How do insurance solutions work in case of cross-border activity?

    a. For a construction party (e.g. contractor, architect, etc) from your country acting in another EU Member State?

    b. For a construction party from another EU Member State acting in your country?

B/Organisation, functioning and impact of construction insurance

1. Structure and functioning of the insurance market.

2. Risk assessment by insurers.

    a. How do insurers assess the risks of construction activities and services?

    b. Which factors are considered by insurers when assessing the risk and hence determining the insurance premium, limits of indemnity, terms and conditions?

    c. How do insurers ensure that construction parties have adequate risk management in place?

        i. At different levels (qualifications, resources…)

        ii. At different stages of the construction process (from early design phase until the acceptance of works)

d. Is the EU standardization activity in the following fields taken into account by the insurers?

i. Construction norms and procedures ☐
ii. Building materials ☐
iii. Energy/environmental performance ☐

If yes, please describe in what way: reduction in insurance premiums, increase in cover limits…

3. Do insurers support innovation and sustainable practices? If so, how?

Yes ☐ No ☐

4. Do you believe that the requirements to insure construction risks could evolve in favour of better cost/benefit ratio for:

a. Consumers ☐
b. Supply chain ☐
c. Insurance sector ☐

If yes, please describe:

C/ Insurance schemes and good practices stimulating innovative solutions, sustainable construction and responsible management, especially in craft and small construction enterprises

1. Have you identified existing schemes or good practices which have enhanced any of the following?

   a. Sustainability ☐
   b. Innovation ☐
   c. Access of small and craft enterprises to the market ☐
   d. Cross-border activities, especially within the EU Internal Market ☐
   e. Cost/benefit ratio for the construction and the insurance sectors ☐
   f. Risks and liabilities assessment ☐
   g. Standards of management ☐
   h. Consumer protection ☐

   If yes, please specify how this is taken into account by the insurers:

2. Can you suggest new insurance schemes or good practices which could enhance the above criteria?

THANK YOU FOR COMPLETING THE QUESTIONNAIRE