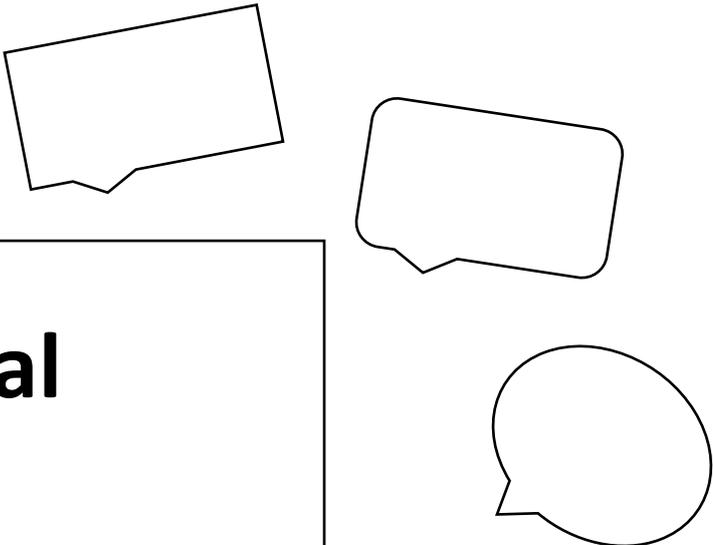




Building a social dialogue for sustainable construction

FINAL REPORT OF THE TRANSNATIONAL "BROAD" PROJECT
DECEMBER 2017



Building a social dialogue for sustainable construction

FINAL REPORT OF THE TRANSNATIONAL PROJECT “BROAD BUILDING A GREEN SOCIAL DIALOGUE”

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<p>Country Report </p>	<p>Comisiones Obreras de Construcción y Servicios</p> 

INTRODUCTION

The construction industry is one of the most important sectors of the economy of the European Union. It contributes more than 9% of the EU gross domestic product and provides about 18 million direct jobs. The role of the push deriving from construction in determining the level of activity in the economic system as a whole is also significant, due to the multiplying effect of the demand for buildings, especially for residential use, in terms of production, the demand for raw materials, intermediate goods and components, machinery and services, with a significant impact on the entire economy.

However, construction is also one of the sectors most responsible for energy consumption and climate-altering gas emissions (the built environment accounts for around 40% of EU energy consumption and 36% of total greenhouse gas emissions), as well as the consumption of resources and the production of waste (EC COM (2015) 614).

Consequently, the transition to sustainability in the construction sector has considerable implications for the economy as a whole, for cities and for the quality and resilience of urban settlements, for policies to combat climate change, for the efficient use of natural resources and for the circular economy.

In this sense, sustainable construction is a privileged field to combine environmental protection and quality of life, economic and employment development, contributing to the recovery of productive activities through quality innovation that brings benefits relating to the three pillars of sustainability (economic, social and environmental).

If, at present, an awareness is growing that a building can be judged as sustainable only if it is so from all three points of view simultaneously – environmental, social and economic, and, therefore, not only on the basis of a lower environmental impact, but also with reference to aspects linked to quality of life – reconciling the various aspects of sustainability is still far from straightforward.

The challenge that the sector finds itself facing is very complex. The changes foreseen point towards a transformation in terms of research and innovation, product and process qualification, rationalisation of production and supply chain relationships, and quality of working conditions. The orientation in favour of sustainability in construction is also a process of change that affects the way of conceiving all phases of the design, construction and management of buildings throughout their entire lifecycle.

This project considers the transition of the sector to a low-carbon economy through the interpretive lens of sustainability in a broad sense. However, within this interpretative framework, the work focuses on the development of “green building” within “sustainable construction”, insofar as it assumes the role of a paradigmatic mirror for the transformations that affect the sector.

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If, in the development of green building, the main focus is on the environmental dimension, i.e. the desire to minimise the impact on the environment of the consumption of resources (energy, water, air, soil) and the production of waste related to the design and construction of buildings in all the phases of their life, in reality it also includes aspects related to the quality of life of people, such as psychophysical wellbeing and health. To guarantee the more virtuous energy performance of buildings, for example, in addition to lowering the emissions of climate-altering gases, it ensures greater healthiness in the home environment and increases levels of comfort, as well as reducing operating costs by effectively combating the problem of fuel poverty, a growing phenomenon in EU countries. The development of green building also has a positive impact in terms of the economy and employment and as regards the ability to create new jobs and encourage retraining for employees in new production cycles.

Therefore, the study of green building demonstrates how close the interrelation of the three dimensions of sustainability is, which therefore have to be considered together, but, at the same time, it also highlights how important it is to focus attention on certain aspects of the transition to more eco-compatible production methods so that the implications can be focused on more clearly.

The project began from the awareness that the transition towards sustainability in the construction sector, and in particular housing, cannot be left to itself and needs to be accompanied to counteract obstacles and enhance the tools and opportunities available for the development of the sector.

In this context, social dialogue plays a fundamental role, the strengthening of which can contribute to effectively addressing the challenges for the construction sector in managing the impact that the transition to a sustainable economy has on the productive system, in terms of the effects on employment and people's working and living conditions. The dialogue between the social partners on meeting the green building development is crucial to improve public governance and economic and social reform within the European Union (European Commission, 2002; ILO, 2011).

Given the multi-dimensional and complex nature of sustainability, which requires multi-level governance of the policies and measures in support of sustainable construction, social dialogue can intervene effectively in supporting the transition to a low-carbon economy and society as a tool and a form of governance in itself.

The main purpose of this project is, therefore, to understand how to reinforce the role of social dialogue in support of the sustainable transformation of the construction sector, and in particular housing, at Italian and European level.

To this end, the undertaking provided an overview of the development of green building at European level and in the project partner countries regarding: regulatory aspects and policies of reference, economic and employment dimensions, the development of research, innovations and new technologies. The project then focused on the role of social dialogue in support of sustainable buildings and in particular green building and, through Italian and European guidelines, identified suggestions and recommendations for strengthening social dialogue in the transition to a low-carbon economy.

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The project involved five EU countries with different models of industrial relations, degrees of technological development and efforts in the promotion of sustainability in construction: Italy, Germany, Spain, Belgium and Poland. The study, after a general overview at European level, focused on a review of the five different national contexts to identify the major trends and compare experiences in Northern, Southern and Central Europe, considering convergences and divergences in the development of green building and the role of social dialogue.

The project was carried out over the two-year period 2015-2017. Therefore, the information contained in this document refers to the period in which the desk and field work was conducted, although the data contained in the reports have been updated in the event of particularly significant changes in the economic situation, or in the policies and initiatives in support of green building and social dialogue that might have occurred during the period.

METHODOLOGY

The desk research for the preliminary report and the national reports was based on the consultation of documentary sources and an analysis of secondary data.

The national reports and the guidelines for strengthening the social dialogue at national and European level were based on a common methodology that includes conducting in-depth interviews with “privileged witnesses” – key players in social dialogue in the field of sustainable construction – and on a path articulated in specific workshops at national and European level that allowed an exchange of knowledge, a comparison between different experiences in the partner countries of the project and mutual learning. The workshops were conceived as proper working groups on social dialogue, called on to share and provide precise indications in this regard.

For the field research in each country, ten interviews were conducted aimed at the following players in social dialogue in the field of sustainable construction:

List of privileged witnesses interviewed
Workers’ representatives at national level for the construction sector
Workers’ representatives at local/company level for the construction sector
Employers’ representatives at national level for the construction sector
Employers’ representatives at local/company level for the construction sector
Representative members for the institutions
Representative members for associations (environmental, civil society, etc.)
Experts

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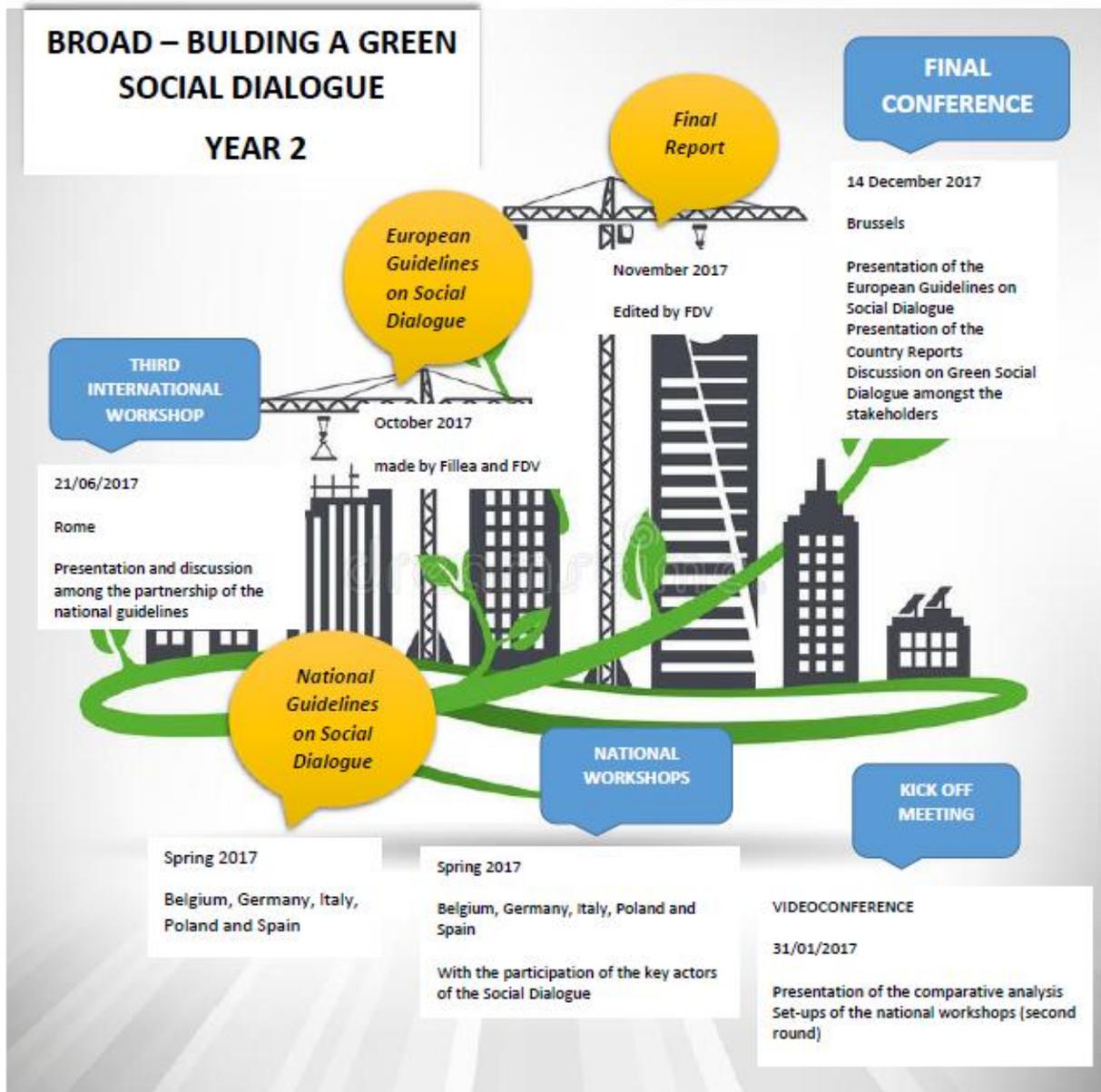
The project, divided into two years of activity, was articulated in the following phases corresponding to modular objectives:

Figure 1a – Outline of the project path (Year 1)



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Figure 1b – Outline of the project path (Year 2)



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Report structure

The report, the result of a two-year project, is organised as follows:

Preliminary report

Chapter 1 describes the general characteristics of the construction sector at European level, highlighting the environmental, economic and social benefits related to the development of green building and indicating the factors that may hinder greening processes in the sector.

Chapter 2 defines the policy and regulatory framework and the most important initiatives in support of green building.

Chapter 3 analyses more profoundly the dynamics of the sector in Europe, with a specific focus on employment, also with reference to the value chain of the sector, the question of skills and training needs related to green innovation processes in building. The chapter ends with the identification of the main drivers of change and innovation in the green building economy.

Chapter 4 reconstructs the role of social dialogue at European level in support of the green economy and the position of the social partners with respect to green building.

Country reports

The five national reports are articulated as follows:

- **Chapter 1. The construction sector: main features**

General description of the main characteristics of the construction sector at national level.

- **Chapter 2. National political framework for sustainable construction**

An overview of the regulatory framework and policies of reference to support the sustainable transformation of the construction sector, focusing on green building.

- **Chapter 3. Major trends in sustainable construction focusing on green building**

Description of the dynamics in the sector through the analysis of the main economic and performance indicators: investments, employment, businesses, innovation. Definition of training needs for sustainability in construction and the identification of barriers to and drivers for the development of green building.

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- **Chapter 4. Social dialogue and sustainable building**

Definition of the role of social dialogue in the transition to sustainability in the construction sector. The interviews conducted in the five partner countries allowed the reconstruction in detail of: the general framework of reference; the position of social partners; initiatives and best practices at national, local and company level; drivers and barriers to strengthen social dialogue in green building.

- **Chapter 5. Guidelines for social dialogue in sustainable construction focusing on green building**

Definition of national guidelines identifying what needs to be done to improve social dialogue in sustainable construction by defining the tools of action on the one hand, and the areas of action, on the other. There are also suggestions and recommendations to strengthen social dialogue in green building conversion processes at European level.

5.1 Tools to strengthen social dialogue

Description of arenas, actors, practices of social dialogue on green building focusing on: what the tools of social dialogue are to improve green building at national level; what is required to strengthen current tools; what new tools need to be created.

5.2 Areas of action

Presentation of guidelines directly referring to the following areas of action:

5.2.1 Policies and legal framework

National and local strategies, incentives and financial policies, certifications, controls, smart cities, social policies.

5.2.2 Working conditions and new skills

Training, quality of work, new skills and new professions.

5.2.3 Technology, knowledge and innovation of the productive processes

Industrialisation, R&D – research and development.

5.2.4 Cultural dimension

Information and communication activities.

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5.3 Directions for social dialogue at European level

Suggestions for European social dialogue both at the level of tools and area of action.

- **Annex: Comparative analysis**

European guidelines for social dialogue in sustainable construction

Presentation of guidelines aimed at strengthening the role of social dialogue in support of the sustainable transformation of the construction sector at European level. The guidelines represent a synthesis of the comparison and examination of the indications that have developed in the national contexts of the project partner countries.

The European guidelines are articulated as follows:

- 1. Preliminary assumptions**, *describing basic guidelines of a general nature.*
- 2. Social dialogue for sustainable constructions in the project countries**, *providing a reasoned synthesis of the state of social dialogue in the five partner countries.*
- 3. Strengthening European social dialogue on sustainable buildings**, *illustrating the essential conditions and key points for the full implementation of social dialogue on sustainable constructions.*
- 4. The European social dialogue on sustainable constructions**, *describing the priority areas of intervention from the point of view of the national partners relating to: **policies and regulatory framework; working conditions and new skills; technology, knowledge, innovation; the cultural dimension.***

Serena Rugiero
(FDV)

Scientific coordinator of the Broad Project



European Preliminary Report

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1. THE SUSTAINABLE BUILDING SECTOR: MAIN CHARACTERISATION

1.1. The construction sector in the EU: an introduction

The construction sector establishes relevant macro-objectives that are of significance to the built environment and the construction sector encompassing the economy as a whole, cities and urban areas, EU climate change policy, resource efficiency, the management of natural resources and the circular economy.

Construction is one of the biggest industrial sectors of the EU economy, comprising enterprises primarily engaged in the construction, renovation, maintenance and demolition of buildings and in civil engineering projects. This industry also has an important multiplier effect on other sectors, contributing to about **9% of EU GDP** (EC 2016). It is also a **key component of its employment sector**, providing around **18 million direct jobs** in Europe (EC 2016). From the perspective of employment, according to ILO (2015) the construction industry has recovered from the economic crisis and “is expected to increase its output in the coming years worldwide, due to increased urbanisation, a housing backlog, infrastructure renewal and the rising demand for water and energy. This will generate employment”. Due to its consistency, housing also represents the **largest direct expense for European households** (an average annual cost per household of € 9,600 or 27% of direct annual spending).

At the same time, the building sector is one of the key consumers of energy in Europe. Indeed, the built environment accounts for around **40% of EU energy consumption** (in two decades and since 1990s in the EU-27, Switzerland and Norway it increased from around 400 Mtoe to 450 Mtoe) (BPIE 2011) and **36% of total green-gas emissions**. It was estimated that in 2013 in the EU there were **233 million residential and commercial buildings** (ECORYS/Copenhagen Resource Institute 2014): residential ones represent the majority of the total EU building stock, covering approximately 75% of the total floor area in square metres, the other uses being retail (7%), offices (6%), education (4%), hotels and restaurants (3%), healthcare (2%) and others (3%) (BPIE 2011). The age characteristics of the EU stock of buildings, together with the ratio between building renovation and replacement, are relevant variables to consider in order to assess their energy and environmental performance (JRC-IPTS 2015): currently about 35% of EU buildings are over 50 years old (BPIE 2011) and there is more interest in better using existing building assets, through renovation interventions, than in building new ones. It is estimated that by improving the energy efficiency of buildings, total EU energy

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consumption could be reduced by 5% to 6%, while CO₂ emissions could be lowered by about 5%.

Furthermore, as recently clearly stated by the EC COM(2015) 614 outlining the principles of the **circular economy**¹, the building sector is also a major consumer, of materials, presenting overwhelming elements of **structural waste** due to low productivity levels, under- or over-utilisation of the buildings themselves, energy consumption (as already stated) and waste of products because of end-of-life and toxic materials (Ellen MacArthur Foundation 2015).

In this overall picture it is crystal clear that the greening of the building sector mainly relies on energy efficiency interventions, including those concerning the enhancement of renewable energy sources.

1.2. Economic, social and environmental benefits of sustainable building

The development of sustainable building is pursued to deliver different kinds of benefit, related to the economic, social and environmental pillars (WGBC 2013).

Economic benefits concern energy-saving issues (the reduction of consumers' energy bills and public finances) and include the overall opportunities for businesses, not only those involved in construction itself, but all those offering technologies, materials and services directly and less directly involved in the building value chain. Likewise, economic benefits pertain to the great employment creation potential associated with green building activities. Furthermore, according to the findings of recent studies (Cambridge Econometrics 2015) a number of other benefits related to energy efficiency interventions in buildings include increased value (investors are willing to pay rental and sales premiums for properties with better energy performance) (Cambridge Econometrics 2015, WGBC 2013). In the framework of the circular economy approach, finally, other positive economic effects are related to the decrease in waste of construction materials and land-fill from demolition (Ellen MacArthur Foundation 2015).

As for the **social pillar**, the beneficial economic effects on households and companies due to the reduction in energy bills deliver increased disposable income and

¹ The Circular Economy is an industrial economy approach covering the whole cycle (from production and consumption to waste management and the market for secondary raw materials) with the aim to produce no waste and pollution.

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consequently also act as a tool to **contrast fuel poverty**². Other social benefits relate to **health** (both physical and mental) and wellbeing, particularly of vulnerable residents such as children (better heated buildings lower mortality as well as morbidity rates due to cold living³ which can also have detrimental mental health impacts) (Cambridge Econometrics 2015). As for **wellbeing**, one issue relates to occupants' satisfaction (better comfort due to hot water availability, sanitation arrangements, indoor air quality, etc.), another one increased workers' productivity (decreased turnover, less sick leave and better morale) due to the technical features of green buildings (including ventilation systems, less toxic materials and furnishings, improved illumination through day-lighting, improved maintenance, etc.) (WGBC 2013, Too L., Too E. 2011).

From the **environmental** point of view, the benefits of the greening of the building sector mainly concern the decrease in carbon emission (worldwide the buildings sector was responsible for 6.4% of the total increase in greenhouse gas emissions in the period 2000-2010) (UNDP 2015) through reduced energy and water use and lower long-term operational and maintenance costs.

1.3. Factors hindering the greening of the building sector

Factors holding back initiatives promoting the greening of buildings have been identified in shortages of skills (which, in turn, affect labour productivity and quality of work), deficiencies in the supply of skills and relevant training, discouraging of investments due to associated up-front costs of green buildings and information asymmetries (among clients, policy-makers, builders, etc.) (ILO 2011). From another perspective, barriers that hinder the uptake of renovation measures in the stock of existing building (which offer the biggest potential in energy savings) were organised by BPIE (BPIE 2011) into different categories, including:

- financial barriers (lack of funds or access to finance; payback expectations/investment horizons; competing purchase decisions and price signals);
- institutional and administrative ones (regulatory and planning regimes; institutional and structural factors, multistakeholder issues);

² At EU level, fuel poverty results from the combination of three different factors: low household income, poor heating and insulation standards, and high-energy prices. According to EU_SILC data, in 2013 the share of the total EU population not able to keep their homes adequately warm was 10.8%, the issue not being confined to countries with colder climates (Cambridge Econometrics 2015).

³According to the World Health Organization across Europe, there were an estimated 250,000 excess winter deaths annually (Cambridge Econometrics 2015, WGBC 2013).

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- hindering factors concerning awareness, advice and skills (lack of advice or information; awareness of energy savings potential/benefits; skills and knowledge related to building professionals)
- barriers related to the separation of expenditure and benefit (as above, concerning information, awareness of potential/benefits, skills and knowledge related to building professionals).

2. EU POLITICAL FRAMEWORK FOR GREEN BUILDING

2.1. Regulatory and legislative framework

At European level, it is the **2000 Green Paper entitled: *Towards a European strategy for energy supply security*** to raise the issue of the increase in EU energy consumption, on the one hand, and the issue of insufficient domestic production to cover energy needs, on the other. From this starting point, the Green Paper refers, in the face of the 'demand', to a real change in consumer behaviour, whose energy demand must be directed – through the leverage of tax instruments – to consumption that is more rational and respectful of the environment (with particular attention paid to the transport and construction sectors). For the 'supply' side the priority is detected in the fight against climate change and the development of renewable energies.

Therefore, the **2002/91/EC Energy Performance of Buildings Directive** – otherwise known by the acronym **EPBD** – is adopted in this direction. EPBD moves from fact that “The energy used in the residential sector and tertiary, composed for the most part of buildings, represents over 40% of the final consumption of energy in the Community. Since this is a growing industry, its energy consumption and hence also its carbon dioxide emissions are expected to rise”, together with the finding that “Buildings have an impact on long-term energy consumption, all new buildings should therefore meet minimum energy performance...”.

The EPBD, therefore, sets out the following key requirements for Member States: a) a general framework for a methodology for calculating the integrated energy performance of buildings; b) minimum standards on the energy performance of new buildings and large existing buildings undergoing ‘major renovation’; c) energy certification for both new and existing buildings whenever they are constructed, sold or rented out; d) the implementation of an inspection and assessment regime for air-conditioning and medium- and large-sized heating systems or, in the case of the latter, the development of information campaigns on the subject.

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In **2005**, the Commission adopted the **Green Paper on Energy Efficiency or Doing More With Less**. This establishes Annual Energy Efficiency Action Plans at national level. Such plans might identify measures to be taken at national, regional and local level and subsequently monitor their success both in terms of improving energy efficiency and their cost-effectiveness. This programming tool is introduced by **Directive 2006/32/EC of 5 April 2006 on energy end-use efficiency and energy service**, which requires Member States to transmit to the Commission a first National Plan of Action on energy efficiency (NEEAP) by 30 June 2007, a second before 30 June 2011, and a third by 30 June 2014, illustrating the energy-efficiency improvement measures to achieve the energy-savings targets set at Community level.

In **2009**, two directives see the light of day: **Directive 2009/28/EC of 23 April 2009 on the promotion of energy from renewable sources** and **Directive 2009/125/EC of 21 October 2009 establishing a framework for the setting of specific ecodesign requirements for energy-related products**.

The first directive, together with the Dir. 2009/29/EC of the same date, introduced the **2020 Climate and Energy package**, known as the “20-20-20” targets (within the growth plan of the Europe 2020 Strategy). The Climate and Energy package is a set of binding legislation, which aims to ensure that the European Union meets its ambitious climate and energy targets for 2020. These targets set three key objectives for 2020: a 20% reduction in EU greenhouse gas emissions from 1990 levels, raising the share of EU energy consumption produced from renewable resources to 20%, a 20% improvement on EU energy efficiency compared to 1990 levels.

For this purpose, each Member State is required to adopt a *National Renewable Energy Action Plans* (NREAP) including sectoral targets for electricity, heating and cooling, and transport.

A further set of targets for 40% reductions below 1990 levels have been proposed by the EU for 2030, together with the long-term objective of reducing greenhouse gas emissions by 80-95% below 1990 levels by 2050.

A distinctive feature of the second directive (also known as the eco-design directive) is to introduce Community specifications for the eco-design of so-called "energy-related products", that is, any good that has an impact on energy consumption during use, which is placed on the market and/or put into service.

On 19 May 2010, a recast of the Energy Performance of Buildings Directive (EPBD recast) was adopted by the European Parliament and the Council of the European Union –

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Directive 2002/91/EC – in order to strengthen the energy-performance requirements and to clarify and streamline some of the provisions from the 2002 Directive it replaces.

Directive 2002/91/EC of 19 May 2010 on the Energy Performance of Buildings establishes minimum-cost optimal-energy performance requirements for new buildings, for major renovation of buildings and for the replacement or retrofit of building elements (e.g. heating and cooling systems, roofs, walls). Member States shall draw up national plans for increasing the number of “nearly zero-energy buildings” (nearly zero-energy building means a building that has a very high energy performance, as determined in accordance with Annex I. The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced onsite or nearby”).

Finally, the European Parliament and the Council approved the **Energy Efficiency Directive 2012/27/EU**, amending Directives 2009/125/EC and 2010/125/EC. The new Directive on energy efficiency relies on upgrading the efficiency of central government buildings as an exemplary role.

The **Energy Performance of Building Directive (2010/31/EU)** identifies the following spheres of activities through which to reduce the energy consumption of buildings:

- energy performance certificates are to be included in all advertisements for the sale or rental of buildings;
- EU countries must establish inspection schemes for heating and air-conditioning systems or put in place measures with equivalent effect;
- all new buildings must be nearly zero-energy buildings by 31 December 2020 (public buildings by 31 December 2018);
- EU countries must set minimum energy performance requirements for new buildings, for the major renovation of buildings and for the replacement or retrofit of building elements (heating and cooling systems, roofs, walls, etc.);
- EU countries have to draw up lists of national financial measures to improve the energy efficiency of buildings.

The **Energy Efficiency Directive (2012/27/EU)** identifies the following spheres of activities through which to reduce the energy consumption of buildings:

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- EU countries make energy-efficient renovations to at least 3% of buildings owned and occupied by central government;
- EU governments should only purchase buildings which are highly energy efficient;
- EU countries must draw up long-term national building renovation strategies, which can be included in their National Energy Efficiency Action Plans.

2.2. EU policy frameworks for building a resource-efficient economy

As we said, the construction system is very complex and its evolution under the profile of green building is a key factor in securing the transition to a “green” resource-efficient economy. Many of the social, economic and environmental potential benefits of green building at EU and national level encompass urban policy, climate-change policy, management of natural resources and the circular economy. The following programmes, strategies and instruments were identified as they are of significance to the green building sector and for their broader relevance in the transition to a sustainable economy (JRC-IPTS, 2015):

i) Climate change policy:

- **The 7 ST Environmental Action Programme (2013)** reinforces the 2020 objective of creating a “low-carbon and resource-efficient economy”. The 7 ST Environmental Action Programme sets out objectives to reduce the overall impact of resource use. Priority Objective 8 of the EAP seeks to enhance the sustainability of the cities of the EU and to place environmental sustainability at the core of urban development strategies.
- **EU Strategy on adaptation to climate change (2013)** the strategy sets out a framework and a mechanism for taking adaptation measures to deal with climate impacts and their economic, environmental and social costs. The strategy highlights the need for the “climate proofing” of cities as well as physical infrastructure and assets.

ii) Urban policy:

- Thematic Strategy for the Urban Environment (2006)
- The Urban Dimension of EU policy (2014)

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iii) Resource efficiency:

- The Raw Materials Initiatives (2011)
- The Roadmap to a Resource Efficient Europe (2011)
- The Clean Energy Package (2016)

iv) Circular economy:

- The Ecodesign Directive (2009)
- The EU action plan for the Circular Economy (2015)

v) The management of natural resources:

- The legal sourcing of timber (2010)
- The EU forest strategy (2013)
- The blueprint for forest-based industries (2013)
- The blueprint to safeguard Europe's water resources (2012)

vi) Construction products and manufacturing:

- The Construction Products Regulations (2011)
- The Industrial Emissions Directive (2010)

vii) Construction and demolition waste:

- The Waste Framework Directive (2008)
- The Landfill Directive (1999)

viii) Indoor air pollution:

- The EU environmental and health strategy (2003)

2.3. Relevant initiatives in support of green building

Initiatives directly supporting green building

In 2012, the **EU Strategy for the sustainable competitiveness of the construction sector** (COM/2012/433) was defined as part of the Europe2020 Initiative, focused on the promotion of favourable market conditions for sustainable growth in the construction sector. Five areas were addressed: financing, skills and qualifications, resource efficiency, regulation and market access.

Starting in 2013 the Public-Private-Partnership between the EC and the private sector represented by the Energy Efficient Buildings Association (E2BA) – promoted by the European Construction Technology Platform – launched the industry-driven research

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and demonstration programme **Energy-Efficient Building (EeB)**⁴. The aim of this initiative is to support the creation of a hi-tech building industry, which turns energy efficiency into a sustainable business, fostering EU competitiveness in the construction sector on a global level (EC 2016).

In July 2014 the Communication **Resource efficiency opportunities in the building sector (COM 214 445)** was released by the EC, the main objectives of this initiative being to promote a more efficient use of resources consumed by new and renovated commercial, residential and public buildings, and to reduce their overall environmental impact throughout their full life cycle. To help bring resource efficiency gains, designers, manufacturers, contractors, authorities and users need useable and reliable information to inform their decision-making. This initiative aimed at addressing this information deficit by proposing a set of clearly defined and measurable indicators for the assessment of the environmental performance of buildings.

In 2016, the EC DG Growth and the EASME (Executive Agency for Small and Medium-Sized Enterprises) set up the **European Construction Sector Observatory (ECSO)**, a tool which provides policymakers and stakeholders with analysis and assessments of market conditions and policy developments in the construction sector. The ECSO website⁵ provides access to industry data and analysis, concerning the performance of EU-28 MS in relation to the five thematic objectives of the Construction 2020 Strategy.

In the same period, the **EU Building Stocks Observatory**⁶ was also set up. It helps monitor and steer the energy performance of buildings across Europe, supporting the implementation of the EPBD.

Moreover, in the framework of the *Clean Energy for All Europeans Package* (COM/20167860) of November 2016 the non-legislative initiative **Smart Financing for Smart Buildings** (COM/20167860 Annex 1) was activated, which aims at unlocking private finance in order to accelerate the renovation of EU buildings. It is organised in three main pillars: financial de-risking based on a more effective use of public funding; technological/technical de-risking through the aggregation of projects and assistance for project development; behavioural de-risking by providing information to investors to reduce the perceived risk of energy renovation projects.

For the implementation of the EPBD the **European Committee for Standardisation (CEN)**⁷ defined a set of **European standards** dealing with the thermal performance of

⁴ http://ec.europa.eu/research/industrial_technologies/energy-efficient-buildings_en.html

⁵ https://ec.europa.eu/growth/sectors/construction/observatory_it

⁶ <http://ec.europa.eu/energy/en/eubuildings>

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buildings and building components, ventilation, light and lighting, heating systems, building automation, controls and building management (EC 2016).

EU Cohesion Policy and Structural Funds

Since its planning (2000-2006), EU Cohesion Policy was intended to promote growth, competitiveness and employment, mostly through **structural funds**. In the 2007-2013 programme aid funds for environmental projects have tripled. 105 billion euros will be invested in the “green economy” which represents more than 30% of the regional policy budget⁸. The following spheres of activity were identified according to information collected about investment of cohesion funds in environmental projects and jobs

- eco-innovation in SMEs,
- railway systems,
- promotion of clean urban transport,
- renewable energies
- energy efficiency
- co-generation
- energy management
- waste disposal
- water management
- promotion of biodiversity and environmental protection
- integrated projects for urban and rural renovation
- rehabilitation of industrial premises and polluted soil
- risk prevention

A substantial part of this endowment (€54 billion) will be allocated to help Member States comply with EU environmental legislation. Furthermore, almost half of the Member States (Austria, Bulgaria, Czech Republic, France, Germany, Hungary, Italy, Poland, Portugal, Romania, Slovakia, Slovenia and the UK) have introduced indicators related to the reduction of greenhouse gases in their cohesion policy programmes.

⁷ <https://www.cen.eu/about/Pages/default.aspx>

⁸ Press Release IP/09/369, Brussels, March 9 2009. <http://europa.EU/rapid/pressReleasesAction.do?reference=IP/09/369&format=HTML&aged=0&language=ES&guiLanguage=en>

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The priorities of the Structural Funds 2014-2020 are: the development of innovation; the enhancement of the competitiveness of SMEs and the transition to a low-carbon economy in all sectors and, in particular, the intelligent management of energy and the development of energy efficiency in public infrastructure and in housing.

Articles 7 and 8 on sustainable urban development illustrate the many applications that will be supported by the Structural Funds. The funds taken as a whole are substantial: they amount to 352 billion euros allocated to the various objectives (see the table below).

It is a significant amount that can double up with national funds and enable substantial investments to the order of 25 billion in seven years. A more detailed analysis on sustainable building development potential should be made by analysing in detail at the national level.

Table 1 – Total EU allocations of Cohesion Policy 2014-2020

Total EU allocations of Cohesion Policy 2014-2020* (million €, current prices)									
	Cohesion Fund	Less Developed Regions	Transition Regions	More Developed Regions	Outermost and northern sparsely populated regions	European Territorial Cooperation		Youth Employment Initiative (additional allocation)	Total
						Cross-Border Cooperation	Transnational Cooperation		
BE	-	-	1.039,7	938,6	-	219,0	44,2	42,4	2.283,9
BG	2.278,3	5.089,3	-	-	-	134,2	31,5	55,2	7.588,4
CZ	6.258,9	15.282,5	-	88,2	-	296,7	43,0	13,6	21.982,9
DK	-	-	71,4	255,1	-	204,2	22,7	-	553,4
DE	-	-	9.771,5	8.498,0	-	626,7	338,7	-	19.234,9
EE	1.073,3	2.461,2	-	-	-	49,9	5,5	-	3.590,0
IE	-	-	-	951,6	-	150,5	18,3	68,1	1.188,6
EL	3.250,2	7.034,2	2.306,1	2.528,2	-	185,3	46,4	171,5	15.521,9
ES	-	2.040,4	13.399,5	11.074,4	484,1	430,0	187,6	943,5	28.559,5
FR	-	3.407,8	4.253,3	6.348,5	443,3	824,7	264,6	310,2	15.852,5
HR	2.559,5	5.837,5	-	-	-	127,8	18,3	66,2	8.609,4
IT	-	22.324,6	1.102,0	7.692,2	-	890,0	246,7	567,5	32.823,0
CY	269,5	-	-	421,8	-	29,5	3,3	11,6	735,6
LV	1.349,4	3.039,8	-	-	-	84,3	9,3	29,0	4.511,8
LT	2.048,9	4.628,7	-	-	-	99,9	13,9	31,8	6.823,1
LU	-	-	-	39,6	-	18,2	2,0	-	59,7
HU	6.025,4	15.005,2	-	463,7	-	320,4	41,4	49,8	21.905,9
MT	217,7	-	490,2	-	-	15,3	1,7	-	725,0
NL	-	-	-	1.014,6	-	321,8	67,9	-	1.404,3
AT	-	-	72,3	906,0	-	222,9	34,4	-	1.235,6
PL	23.208,0	51.163,6	-	2.242,4	-	543,2	157,3	252,4	77.567,0
PT	2.861,7	16.671,2	257,6	1.275,5	115,7	78,6	43,8	160,8	21.465,0
RO	6.935,0	15.058,8	-	441,3	-	364,0	88,7	106,0	22.993,8
SI	895,4	1.260,0	-	847,3	-	54,5	8,4	9,2	3.074,8
SK	4.168,3	9.483,7	-	44,2	-	201,1	22,3	72,2	13.991,7
FI	-	-	-	999,1	305,3	139,4	21,9	-	1.465,8
SE	-	-	-	1.512,4	206,9	304,2	38,1	44,2	2.105,8
UK	-	2.383,2	2.617,4	5.767,6	-	612,3	253,3	206,1	11.839,9
Interregional cooperation									571,6
Urban innovative actions									371,9
Technical assistance									1.217,6
EU28	63.399,7	182.171,8	35.381,1	54.350,5	1.555,4	7.548,4	2.075,0	3.211,2	351.854,2

* breakdown by category of allocations subject to transfers between categories at the request of the Member States

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Practical support initiatives

To help EU Member States properly implement the Energy Performance of Buildings Directive (2010/31/EU) and to achieve energy-efficiency targets, the European Commission has established the following practical support initiatives:

- **Concerted Action EPBD:** a forum launched by the Commission to promote dialogue and the exchange of best practices between countries when it comes to reducing energy consumption in buildings.
- **BUILD UP Skills:** an initiative to help craftsmen, on-site construction workers and systems installers in the building sector. Its aim is to increase the number of qualified workers across Europe able to undertake energy-efficient building renovations and help construct nearly zero-energy buildings.
- **BUILD UP Web Portal:** the Build Up Portal (www.Buildup.eu) brings together European experts on energy reduction in buildings. The aim is to share information, to exchange best working practices and knowledge, and to transfer tools and resources.

In order to drive improvement in resource efficiency in the construction sector through a common EU approach to assessment, in 2015 – in close cooperation with industry stakeholders and the public sector – the European Commission began to develop a framework of indicators with the intention of creating a flexible system of indicators, to be incorporated into new or existing assessment schemes, or to be used on their own by different stakeholders. In September 2017, the **voluntary reporting framework LEVEL(s)** was set up⁹ (to be tested for next two years), aimed at providing a common “sustainable” language for the building sector: a set of simple metrics for measuring the sustainability performance of buildings throughout their life cycle, focusing on areas such as greenhouse gas emissions, resource and water efficiency as well as health and comfort. The name given to this framework refers to the different levels at which it can be used.

Furthermore, in 2016 the European Commission launched a “**Fitness Check**” for the Construction Sector¹⁰, which aims at assessing the impact of EU legislation on it, through the evaluation of the **relevance, effectiveness, efficiency, coherence and EU added value of the legislative framework**. The policy areas of Internal Market, Energy

⁹ <http://ec.europa.eu/environment/eussd/buildings.htm>

¹⁰ https://ec.europa.eu/growth/sectors/construction/fitness-check_en

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Efficiency, Environment and Health and Safety are investigated, through the analysis of 15 EU legislative texts.

Finally, In order to encourage the use of Building Information Modelling (BIM) in public works, the **EU BIM Task Group** (gathering the collective experience of public policy makers, public estate owners and infrastructure operators from over twenty European countries) in July 2017 drafted the ***Handbook for the Introduction of Building Information Modelling in the European Public Sector***¹¹.

3. MAJOR TRENDS IN THE SUSTAINABLE CONSTRUCTION ECONOMY

3.1. Economic trends in the construction sector

The financial and economic crisis had a major impact on the construction sector in nearly all EU Member States (MS). According to data and statistics provided by EUROSTAT (2017), the **downturn in activity for construction** within the EU28 lasted longer than for industry: in the period 2007-2017 the EU-28 index of production for construction¹² fell from a peak in February 2008 to a low in March 2013, a decline that left construction output 26.2% lower than it had been. Trends concerning the **construction of buildings** – the dominant part of construction output – showed a slightly greater magnitude in the contraction from February 2008 to March 2013, totalling 26.9% in the EU-28¹³.

This long and deep downturn in construction activity was **widespread within the EU-28**: EUROSTAT (2017) highlights that during the 2012-2016 period all but five EU MS experienced at least two years of contraction in construction output (in this framework Italy and Portugal each recorded five consecutive negative annual rates of change in their construction activity; in Italy it was even longer, extending back to 2008).

¹¹ <http://www.eubim.eu/handbook/>

¹² According to EUROSTAT the *index of production for construction* is a business-cycle indicator which measures the monthly changes in production of buildings (residential and non-residential) and of civil engineering (roads, railways, bridges, tunnels, utility projects). Available at http://ec.europa.eu/eurostat/statistics-explained/index.php/Glossary:Production_in_construction.

¹³ For more details access the EUROSTAT - *Figure 4: Index of production, construction, EU-28, 2007-17*, available at http://ec.europa.eu/eurostat/statistics-explained/index.php/Industry_and_construction_statistics_-_short-term_indicators

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Table 2 – Annual growth rates for constructions: index of production, 2012-2016

Country	2012	2013	2014	2015	2016
Austria	3.4	0.4	-1.7	-1.6	0.5
Belgium	-1.0	-2.1	-0.7	-2.4	0.2
Bulgaria	-0.6	-3.9	7.2	10.8	-16.6
Croatia	-12.1	-4.6	-7.3	-1.0	2.5
Cyprus	-21.0	-18.9	-21.6	0.2	13.0
Czech Rep.	-7.4	-6.8	4.3	7.1	-6.1
Denmark	0.9	-0.7	4.3	4.4	5.6
Estonia	16.7	-0.1	-2.1	-3.4	2.6
Finland	-0.9	-3.2	0.4	5.9	6.1
France	-5.2	0.6	-2.2	-4.7	-0.3
Germany	-1.1	-0.3	2.7	-2.2	0.8
Greece	-33.4	-8.2	15.3	3.1	22.7
Hungary	-6.5	8.4	13.5	3.0	-18.8
Ireland	-2.4	11.3	8.2	7.9	18.5
Italy	-13.4	-10.3	-6.7	-1.9	-0.3
Latvia	14.4	7.4	7.9	-1.2	-17.9
Lithuania	-7.2	11.7	16.5	-3.5	-9.6
Luxembourg	-3.7	-4.2	3.6	-1.5	3.8
Malta	1.7	1.9	2.4	15.9	-3.8
Netherlands	-8.1	-5.2	4.3	8.5	7.0
Poland	-5.0	-10.1	4.1	-0.3	-14.0
Portugal	-16.2	-16.0	-8.9	-2.3	-3.3
Romania	1.4	-0.7	-6.6	10.6	-4.8
Slovakia	-12.4	-5.2	-4.2	17.9	-10.7
Slovenia	-16.8	-2.6	19.5	-8.1	-17.8
Spain	-5.5	1.4	17.4	1.8	5.2
Sweden	-6.1	-3.2	1.3	11.6	10.9
United Kingdom	-7.5	1.6	8.8	4.1	2.4
Total EU-28	-5.8	-1.8	3.1	0.9	1.4

Source: EUROSTAT 2017

By 2016, construction output in Cyprus, Slovenia, Portugal, Ireland and Greece was less than half the level in 2007. During the overall period 2007-2016, construction output declined by more than one fifth in half of the all MS. In 2016, six MS (Malta, Finland, Sweden, Germany, Poland and the United Kingdom) showed higher activity than there had been in 2007 (EUROSTAT 2017).

Nevertheless, according to the ILO (2015) at present and worldwide **global construction output has recovered from the crisis** and it is expected to grow in the coming years, due

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to increased urbanisation, a housing backlog, infrastructure renewal and the rising demand for water and energy.

Grey economy

It needs to be underlined that a large amount of the activities in the construction sector are carried out within the framework of a somewhat **grey economy** (if not directly informal), which is difficult to detect but nevertheless well established. The *BUILD UP Skills* national reports have tried to estimate the size of the grey economy that varies greatly across the countries and proves to be a difficult exercise. Some examples provided in the *EU Overview Report* report the following:

- in *Bulgaria*, according to the Bulgarian Construction Centre “the relative share of construction companies which operate in the non-formal sector had reached the level of 15/20% within a period of 10 years”;
- in *Poland* it was estimated that for the year 2010 construction and installation services, on the one side, and maintenance, repair and installation works, on the other one, were going to contribute respectively 16.8% and 13.9% of the total Polish grey economy (representing 2,1% of the Polish GDP);
- in *Spain* it is estimated that the GDP generated by the construction sector in 2009 relied upon activities belonging to the grey economy for 29.3% (BUILD UP Skills 2014).

Small-sized enterprises

Construction activity is primarily **local**, the sector being **fragmented** and mainly composed of **micro-companies**. According to information collected by the EBC (2016) concerning EU-28 countries in 2015 and 2016, 91.9% of more than 3 million companies engaged in the construction sector have less than 10 employees each, while only 1% have more than 50 employees (even though these companies are engaged in 40% of the total activities) (ITC ILO 2014). Small and medium construction enterprises employ 83% of the total workforce of the sector (EBC 2016).

A few examples from a number of EU countries (based on the last available data) are quite representative from this point of view (BUILD UP Skills 2014):

- in *Belgium* two-third of the businesses are one-person companies and 21% of them have 1 to 4 employees;
- in *Bulgaria* micro-companies with less than 9 employees are 83.8%, while those with more than 250 are 0,3%

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- in *France* 58% of companies involved have no employees, while 36% are micro-companies (1-9 employees);
- in *Germany* in 2011 two-thirds of the companies operating in skilled building, fitting and finishing trades operated with less than 5 employees, 18.9% had 5-9 employees and 9% had 10-19 employees.
- in *Romania* 86% of the companies are micro-companies(1-9 employees);
- in *Spain* over 90% of the businesses in the construction sector have no salaried employees or fewer than 10.

3.2. Employment trends in the construction sector

As mentioned above, the construction sector has been hit particularly hard by the global economic and financial crisis in many countries, given its strong dependency on access to credit (ILO 2015). Enterprises and workers have been affected in terms of fewer contracts for projects and worse levels of employment, while job losses concerned all workers, from engineers and architects to electricians and masons. Currently employment trends greatly vary across Europe and if in construction they have more or less recovered after the crisis in Northwestern Europe, it is not like that in Eastern and, above all, Southern European countries. As a matter of fact, these have faced major decreases: for instance, in the 2008-2013 period, employment in the construction sector decreased 58.5% in Greece, 55% in Spain and 44% in Portugal (ILO 2015).

The following table presents **employment data in the construction sector** in the period 2010-2016 in the countries of the partners of the BROAD project.

Table 3 – Employment in the construction sector in 2010-2016 (selection of countries)

	Belgium		Germany		Italy		Poland		Spain	
	Persons/ 1,000	% total employ.								
2010	322.7	7.1	2529.8	6.2	1889.0	7.7	1256.7	8.1	151.4	8.4
2011	337.5	7.3	2576.8	6.2	1791.2	7.3	1278.9	8.2	103.9	7.3
2012	324.9	7.0	2623.6	6.2	1699.9	7.0	1253.3	8.0	161.3	6.3
2013	329.7	7.1	2685.2	6.4	1553.2	6.6	1184.5	7.6	129.5	5.7
2014	325.1	7.0	2731.8	6.4	1484.1	6.2	1186.6	7.5	993.5	5.5
2015	323.3	6.9	2742.2	6.3	1468.3	6.1	1206.7	7.5	137.7	5.8
2016	335.1	7.1	2759.0	6.3	1403.8	5.8	1223.0	7.6	1073.9	5.6

Source: our elaboration based on OECD data (25/09/2017)

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Despite its adverse effects, with an increased number of bankruptcies and higher rates of unemployment, displacing more than **18 million direct jobs** (EC 2016) **the building sector still remains a major employer in the EU** (ILO 2015a, 2015b) **and often even the largest** (for instance last available data concerning the construction industry in *Bulgaria* reports that the building workforce involves about 7% of all those employed, standing out as the biggest industrial employer in the country; in *Finland* approximately 10% of the gross national product is used in construction) (BUILD UP Skills 2014).

The current **18 million direct jobs** are distributed in more than **3 million enterprises** (mainly micro ones: 98% of them employed less than 20 workers – EBC 2016), present in the EU-28 MS as follows.

Table 4 – Enterprises in construction industry in 2016

Country	Total number of enterprises	Country	Total number of enterprises
Austria	34,000	Italy	529,000
Belgium	113,000	Latvia	7,000
Bulgaria	19,000	Lithuania	10,000
Croatia	3,000	Luxembourg	2,000
Cyprus	7,000	Malta	6,000
Czech Rep.	320,000	Netherlands	153,000
Denmark	30,000	Poland	160,000
Estonia	8,000	Portugal	47,000
Finland	42,000	Romania	77,000
France	433,000	Slovakia	3,000
Germany	365,000	Slovenia	18,000
Greece	85,000	Spain	407,000
Hungary	89,000	Sweden	102,000
Ireland	47,000	United Kingdom	209,000
Total EU-28		3,326,000	

Source: FIEC 2017

Finally, it is worthy stressing that according to the findings of recent studies on the economic and social impact of energy-efficiency investment (Cambridge Econometrics 2015), **energy-efficiency measures deliver** positive output effects, not only in terms of GDP (ranging from 0.8% to 1.3%) but also in terms of **positive net employment effects** (according to the intensity of the measures). Some examples concerning the building sector are provided in the box below.

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Box 1 – Energy-efficiency investment effects on employment

POLAND

A study on the employment impact of deep building renovation in *Poland* estimates that a programme costing between €2.2bn and €7bn in 2010 prices and saving between €0.6bn and €1.3bn of energy in 2010 prices could generate between 86,000 and 254,000 additional jobs per year in 2020, depending on the intensity and depth of the building renovation scenarios.

USA

According to another study carried out as for the *USA* by the American Council for an Energy Efficient Economy (ACEEE), \$1m of investment in a labour-intensive industry such as construction (especially in refurbishment and installation of EE measures in building) supports, on average, 20 construction jobs compared to just 14 in less labour-intensive manufacturing sectors.

ESTONIA

In *Estonia* it was estimated that in renovating apartment buildings €1m of investment could create directly and indirectly 17 jobs (10 in onsite construction activities and between one and six respectively in consultancy and manufacturing activities).

Source: *Cambridge Econometrics 2015*

Employed workers' characteristics

The majority of employed workers in the construction sector are **low and medium-skilled**, the high-skilled ones numbering below 10% (ITC ILO 2014). In 2010, medium-skilled labour accounted for 52% of the workforce and were expected to reach 56% by 2025 (the high-skilled being expected to increase by 6%, while the low-skilled were estimated to decrease by 10% in the same period, according to CEDEFOP scenarios) (ETUC 2013). Examples from national reports provided by *BUILD UP Skill Initiative* account for:

- 63% of low-skilled workers in *UK* in 2009;
- 46% of low-skilled workers in *France* in 2010 for those employed in the building sector;
- 56.5% of employees of the construction sector in *Spain* having a level of education equivalent to the first stage of secondary education (usually targeting students aged 12-16) or lower;
- 84% of craftsmen and onsite workers having a vocational education and training qualification in *Germany*.

Despite some recent increases in **female participation** in the workforce, the building sector is a typically male-dominated area. According to the ILO (2015a), women are sometimes employed in family companies, but often without receiving direct payment. Indeed, rates of female participation in the West European construction sector stand at

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7.5%, while paid female workers in the sector are 1%. Of course, the situation varies widely across countries: *BUILD UP Skills* national report from *France* reported 1.6% of females in the building workforce, while in *Germany* their presence amounted to 5.6%. It is worth stressing that in *Greece* the presence of women in the construction sector increased between 2009 and 2013 (ILO 2015a).

As for the **age of the workforce**, according to *BUILD UP Skills* national reports the majority of workers are aged between 25 and 54; some countries specifically highlight the issue of an **ageing workforce** (in *Sweden*, for instance, in the period from 1999 to 2009 the 55+ age group of workers grew from 16.8% to 21.4%). ILO (2015a) also focuses on the demographic dynamics occurring in many countries and causing an increased rate of retirement of construction workers, with the resulting need to train and hire new ones (see below), since experienced workers are usually replaced by less experienced ones.

Another issue relevant to the composition and characteristics of the construction workforce relates to **migrant workers**. Some European countries report difficulties in retaining highly specialised building workers (*Romania* and *Estonia*, for instance), while some Northern countries (*Finland*, *Sweden* and *Norway*) in recent years have seen an increase in foreign workers. In contrast, due to the economic crisis, migrant workers left countries such as *Spain* and *Ireland*.

Labour shortages

In spite of the employment loss (for both skilled and low-skilled workers) in the construction sector due to the crisis, according to the findings of the *BUILD UP Skills* national reports (BUILD UP Skills 2014), in the long run most countries will face at least a **slight shortage of relevant workers** (the median of the highest estimates refers to one-fifth of the current workforce)¹⁴. Indeed an increase in the number of employees is expected for 2015-2025, reaching nearly 19 million workers (7.5 million employees will be necessary in order to replace those leaving the workforce due to retirement, migration or mortality) (ETUC 2013).

The findings of the calculations carried out by some countries taking into account workers' occupations (ISCO) among those with highest demand in the labour market include (BUILD UP Skills 2014):

¹⁴ In *Germany* additional craftsmen and onsite workers needed by 2020 amount to 90,000, in *Italy* 100,000, while in *Spain* 166,000 workers are needed. No data is available for *Belgium* and *Poland* (BUILD UP Skills 2014).

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- Electricians/electrical equipment installers;
- Carpenters/joiners;
- Plumbers;
- RES installers;
- Bricklayers;
- Insulation workers.

A number of issues that could affect the future supply of workers in the sectors, making the amount greater than current estimates, were also highlighted, including:

- Growth of the industry;
- Emigration of workers out of the country;
- Demographic trends (low birth rates);
- Occupational flexibility of the workforce;
- Changes in educational qualifications and workforce supply;
- Health and safety issues;
- Age;
- Level of implementation of government policy action;
- Changes in regulatory frameworks.

The foreseen labour shortages mainly affect **changes in the demand for skills** related to the transition to the greening of the building sector (ILO 2012). Indeed at present many employers face difficulties in finding qualified people to work in green building (as is currently happening in *Finland*, for instance) (BUILD UP Skills 2014) due to the fact that skill requirements change as green building technologies and practices are introduced or changed (ILO 2012, 2015a). Closing **skills gaps** (see below) is therefore all the more important in order to avoid labour shortages. It is worth remembering, however, that this sector has historically been characterised by very poor working conditions and consequent high turn-over rates (qualified workers moving to other sectors or countries in order to find better employment opportunities), offering an opportunity for totally unskilled workers (or people in irregular situations) or even an entrance to the labour market.

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3.2. The value chain of the construction sector

The issue of occupation in green building greatly relies on its value chain. In 2012, the ILO underlined that the greening of the building sector should be framed in the **wider value chain that produces and improves buildings**. The ILO organised this value chain into six different clusters also including those businesses involved in the production and distribution of building products and materials, the delivery of professional services (architectural and engineering consultancies), clients, organisations in charge of control and enforcement functions, financing, research, education and policymaking. The six clusters relate to:

- conceiving, planning, designing and advising;
- construction, installation and maintenance;
- controlling;
- enabling;
- manufacturing and distribution;
- green building clients.

According to these clusters of the green building value chain, the ILO identified the **core green building occupations**.

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Table 5 – Core occupations per clusters of the green building value chain

CLUSTERS	CORE GREEN BUILDING OCCUPATIONS PER CLUSTER		
CONCEIVING, PLANNING, DESIGNING AND ADVISING	<ul style="list-style-type: none"> • Construction company managers and business functions • Architects and civil/structural/environmental engineers • Architectural technicians and technical drawing specialists • HVAC, electrical, mechanical, sanitary, renewable energy and building services engineers/designers • Surveyors • Energy, water efficiency and waste management analysts, consultants and advisers 		
CONSTRUCTION, INSTALLATION AND MAINTENANCE	<ul style="list-style-type: none"> • Building site supervisors, site engineers, architects 		
	Conservation	<i>Insulation/ weatherisation</i>	<ul style="list-style-type: none"> • Bricklayers, carpenters, plasterers, glaziers, masons, roofers, painters/decorators – semiskilled occupations that assist
		<i>Efficient heating and cooling</i>	<ul style="list-style-type: none"> • Plumbers and heating installers/maintainers • HVAC installers • Electricians and IT technicians
		<i>Conservation of electric power (other than electric heating and cooling)</i>	<ul style="list-style-type: none"> • Electricians and installers of energy management systems (at domestic level, mostly responsible for helping individual householders to choose energy-efficient appliances and lighting technologies)
		<i>Water conservation</i>	<ul style="list-style-type: none"> • Plumbers
	Building level renewable energy (and high efficiency energy) systems	<i>Heating/cooling</i>	<ul style="list-style-type: none"> • Installers/maintainers of solar thermal systems • Installers/maintainers of wood pellet and other biomass heating systems • Installers/maintainers of mass heating (large building or district) and combined heat and power (CHP) systems • Heat pump Installers/maintainers
		<i>Electricity</i>	<ul style="list-style-type: none"> • Installers/maintainers of solar photovoltaics (PV) • Installers/maintainers of small-scale wind energy systems

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CONTROLLING	<ul style="list-style-type: none"> • Energy auditors • Inspectors, certifiers and quality controllers
ENABLING	<ul style="list-style-type: none"> • Policy makers • Urban planners • Financing • Educators and information providers • Researchers
MANUFACTURING AND DISTRIBUTION	<ul style="list-style-type: none"> • Manufacturers and distributors of green building materials and products • IT&system technicians
GREEN BUILDING CLIENTS	<ul style="list-style-type: none"> • Developers • Energy managers, facilities managers and building managers • Public servants working in procurement and management of buildings • Householders and tenants

Source: ILO 2011

Recently, tackling the issue of transformational change in the construction sector, BPIE (2016) highlighted the **complexity of the dynamic relations** of the different players involved as suppliers in the construction value chain. In a high-level frame of the construction value chain – divided into four main areas: preparation and design, execution, user phase and disposal and recycle – the supply players involved in the “execution” area are identified according to their core-activities:

- On-site execution (also concerning operation and maintenance activities), involving contractors and subcontractors and installers (HVAC, electricity, RES, etc.);
- building services, concerning architectural, engineering, energy and building management services;
- building supply activities, concerning providers of raw and building materials, installations and buildings equipment and machinery.

In this proposed frame, other non-construction players – directly or indirectly involved in it – are also referred to, such as onsite providers and purchasers (for energy, ICT, water and sewage, etc), service economies (financial, real estate, communication and cleaning sectors), etc.

To complete the picture BPIE (2016) further emphasises the issue of the **complexity of the demand side of the construction value chain**, referring to very diversified segments which include: building typologies, users, owners, user status, type of work, construction approach, financing methods, energy performance, climate zone, building codes, etc. (for each segment further sub-classifications can be identified). Furthermore, to better finalise the contribution of all those involved in the provision of value in the

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construction of buildings, the relevance of the **end-use functionality of buildings** is focused on, concerning three main areas: shelter (live, work, play, sleep, etc.); comfort (indoor air quality, thermal environment, solar-lightening, etc.); identity.

3.3. Skill needs and training

Skill needs in the construction sector

It is widely acknowledged (ILO 2011, 2012, 2015a, EUROFOUND 2012, BPIE 2011, BUILD UP Skills 2014, Cambridge Econometrics 2015, CDEFOP/OECD 2015, ETUC 2013) that the greening of the construction sector leads to a movement towards **more skilled jobs**¹⁵, a cause of labour shortages, as already stressed: according to BPIE (2011) and Cambridge Econometrics (2015), for instance, in the near future there will be demands for new skills for technicians, managers and operators both in the design and construction stages. These demands are to be framed in the context of the overall systemic weakness of the EU workforce detected by CEDEFOP (2009) a few years ago and still undermining the current scenario. Particularly relevant to industrial competitiveness and green jobs in general appears to be a lack of scientific, technological, engineering and mathematical (STEM) skills (Cambridge Econometrics 2015)¹⁶.

Skills demands have to be contextualised, since they depend heavily – among other issues – on the energy characteristics of European building stocks and the required level of retrofitting standards (it was stressed, for example, that building stock in Central and Eastern Europe is less energy efficient, due to the fact that many of them were constructed at a time of cheap energy costs). Similarly it is stated that the skills gap is likely to be larger in countries where the technical potential for energy savings is greater (newer Member States such as Bulgaria, Romania and the Baltic states) (Cambridge Econometrics 2015).

Tackling the issue of **skills shortages** for the greening of the building sector, apart from skills needs relating to specific occupations (see below), in 2011, ILO identified a set of **“core skills for green buildings”**¹⁷ needed by workers in all areas. These core skills refer to:

¹⁵ According to the ETUC the construction sector “is moving towards a more sophisticated labour-force” (ETUC 2013).

¹⁶ The lack of STEM skills was recently restated during the Symposium entitled “Green Growth, Green Jobs: Integrating Environmental and Employment Policies in the EU”, Brussels, 17 June 2015.

¹⁷ The ILO document specified in a footnote that *“core skills/core employability skills’ refers to non vocational/non-technical skills or competencies that are needed to perform at work and in society. They apply to work in general, rather than being specific to an occupation or industry”*.

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- Adaptability to change, due to the rapidity of changes;
- Environmental awareness;
- Interdisciplinary skills (crossing traditional occupational boundaries at individual level and fostering an ability to work with people trained in other disciplines);
- Team-working, coordination and leadership skills;
- Interpersonal and negotiation skills (to allow workers to adequately communicate in all possible different working environments, from construction sites to people's homes);
- Problem solving and critical thinking;
- Business and marketing skills;
- Foreign languages.

It is worth remembering that under the ILO (2011) approach, there exists a **dynamic relationship between green building practice and skills**: the latter are thought about as part of a dynamic system within which available skills and the underpinning capabilities interact with ongoing green building practices.

More recently the *BUILD UP Skills EU Overview Report* (2014), based on the analysis of data and information collected in thirty national reports, reported that overall data suggests it is more urgent to **up-skill the existing workforce, rather than retrain it**, highlighting the importance of the issue of **continuing education** of the workforce. Due to technological innovations affecting existing occupations, the working activities of the latter are enriched with new meanings and contents, very dependent, in turn, on a **continuous adaptation of workers' skill sets**. Furthermore, evidence collected in the *BUILD UP Skills EU Overview Report* demonstrates that the overall need for training the workers involved is higher than the estimated future labour demand (more than 3 million workers are estimated to require up-skilling on energy efficiency or renewable energy sources by 2020).

According to the *EU Overview Report* the **occupations with the most urgent training needs (additional training)** on average comprise: bricklayers and stonemasons, carpenters and joiners, plumbers and pipe fitters, insulation workers, building and related electricians and roofers. **Occupations mentioned less often** include: glaziers, concrete placers, concrete finishers and related workers, plasterers, floor layers and tile setters, electrical mechanics and fitters.

The Danish Technological Institute (2009) identified specific management-level shortages in planning skills and knowledge of procurement forms and social, negotiation

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and communication skills. At the level of workers, specific needs were detected concerning: skills in green solutions (regarding solar thermal energy, rainwater harvesting, air-source heat pumps, etc.); and literacy, numeracy and ICT skills. Skills required for low-qualified workers included knowledge about different trades (and the associated materials and technologies) and basic reading, writing and arithmetic.

Skills gaps related to occupations have been identified worldwide by the ILO research (2011). Some overall or EU-related suggestions are reported in the following paragraphs, organised under the six clusters of occupations in the green building sector (see above).

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Box 2 – Skills gaps per occupation in the green building sector

Conceiving, planning, designing and advising occupations

The highest amount of skills deficiencies was identified in this area. In many countries, both architects and civil engineers lacked the skills to work in green building. Many skills gaps among construction professionals concerning building retrofitting projects were detected. A lack of knowledge of life-cycle analysis of building materials and products was identified.

Construction, installation and maintenance

Major skills gaps were identified at the operational level concerning the construction of green buildings, such as installing and maintaining green building technologies. Many gaps were acknowledged referring to future needs (as for instance those related to installing insulation).

Controlling occupations

Country-level research showed a growing requirement for skills in this area (assessment of works against planning requirements and building regulations; proper installation of specific technologies; adherence of broad-based retrofitting projects to building regulations and project plan and design; assessment of new and retrofitted buildings against green building standards).

Education, research, financing and policymaking occupations

The need for upgrading skills among educators, instructors and trainers was identified. Skills needs concerning other areas (research, finance and policymaking) occurred only in a sporadic way.

Manufacturing and distribution occupations

These two areas resulted as too large to define cross-cutting skills gaps. Since distributors of green building materials and products also act as advisers and trainers to builders and construction professionals, they need to up-skill their customer-facing staff, to better equip them to provide advice.

Green building clients

Three areas requiring development of skills were identified: green procurement, energy management, and householders and building owners.

Source: ILO 2011

Apart from specific skills needs related to different occupations, **requirements for additional knowledge, skills and competences are also present across the construction industry**, and transferable skills – such as leadership, learn to learn, project

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management, foreign languages – are all considered the most important for workers in SMEs (BUILD UP Skills 2014).

These overall pictures (above all those provided by the *BUILD UP Skills EU Overview Report*) on the different needs of targeted workers account for **insufficient current CVET (continuing vocational education and training) provisions** with respect to EE and RES in the building sector (BUILD UP Skills 2014). The need for a change in the skills sets also leads to a **transformation of existing occupations** (occurring in most if not all of them), rather than the emergence of completely new ones (even though, of course, some potential new occupations do exist). This transformation depends greatly on the technological innovation processes inserted in the work activities, which require the adaptation of existing skills sets.

Training of the building workforce

From the point of view of **EU policy for training the building workforce**, obviously the issue of skills and jobs is very present in the various strategic documents concerning the building sector. Improvement of the human-capital basis of the sector represents, for instance, a key component of the EC COM(2012) 433 *Strategy for the sustainable competitiveness of the construction sector and its enterprises*, while the EC COM(2011) 109 *Energy Efficiency Plan* directly refers to the *BUILD UP Skills Initiative* as an instrument supporting Member States in assessing training needs for the construction sector, defining relevant solutions to meet them and developing training schemes.

Indeed, under the framework of the Intelligent Energy Europe (IEE) programme (the instrument to support EU energy efficiency and renewable-energy policies) the previously mentioned ***BUILD UP Skills Initiative*** was launched in 2011 in order to unite forces and increase the number of qualified workers in the building workforce across Europe. The Initiative focuses on continuing education and training of craftsmen and other onsite workers in the building sector and is organised into three main components, concerning: national qualification platforms and roadmaps to 2020 (based on the identification of main skills gaps and training needs of the workforce at national level); the introduction of new and upgrading of existing qualification and training schemes; Europe-wide support activities (CEDEFOP/OECD 2015).

In parallel, the **framework for vocational education and training is evolving**, with Member States referring to the European Qualification Framework (EQF) that acts as a translation device to relate different countries' national qualification systems to a common European framework of reference. As stated by the *BUILD UP Skills Initiative*

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itself “the objective is to facilitate the understanding and comparisons of the qualifications levels of different countries and different education and training systems”. Furthermore, this creates opportunities to develop qualification schemes in line with the EQF and use other instruments such as the ECVET (European Credit System for Vocational Education and training) voluntary credit system (CEDEFOP/OECD 2015).

In order to support the training of the building sector workforce, different **EU instruments** have been provided, such as the Leonardo da Vinci strand and the Lifelong Learning Programme (2007-2013) for projects on vocational education and training (some of them directly focusing on the building sector); the European Social Fund also supports projects related to vocational training and lifelong learning opportunities, while a number of training projects were funded under Intelligent Energy Europe (BUILD UP Skills 2014).

Barriers to training and lifelong learning activities for the workforce of the building sector were identified – looking at the 30 national reports drafted by countries participating in the *BUILD UP Skills Initiative* – in the administrative, legal and policy-related areas (the fragmented and unstable political environment, for instance), in the market (considered small and characterised by few demands for energy efficiency and RES solutions), at the economic and financial level (due to lack of funding, their short-term availability, etc.), in education and training (low quality, limited supply not adapted to labour-market demands, underdeveloped training infrastructures and materials) and also due to cultural and linguistic issues (concerning the presence of foreign building workers) (CEDEFOP/OECD 2015).

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3.4. Drivers, changes and innovations in the green building economy

The main tendencies of the green building sector are referred to in the present paragraph considering:

- **compliance with the requirements of the Energy Performance of Buildings Directive (EPBD)** concerning minimum energy performance (MEP) and energy performance certificates (EPCs);
- the **drivers of change** in the construction sector, taking into account **factors affecting the development of green building** discussed in recent relevant documents;
- a number of **industrial innovation opportunities** for the construction sector;
- orientation towards the **reduction of structural waste** in the built environment, in the framework of the circular economy approach.

Compliance with the EPBD

The EPBD constitutes the main policy tool to drive energy efficiency in the built environment, which accounts for around 40% of EU energy consumption and 36% of total greenhouse-gas emissions (EC 2008). As previously mentioned, compliance with the EPBD is therefore strategic in order to achieve the full energy efficiency and carbon-savings potential of buildings. The paths undertaken by different Member States (MS) across EU-28 towards full compliance at national level provide a useful picture to understand the green building sector at present, as well as providing glimpses of future directions. Recently the DG Energy of the European Commission delivered a study (ICF International-EC/DG Energy 2015) focusing on the compliance with national legislations the different MS put in place in order to achieve the requirements of EPBD. To this end, for each MS, national frameworks and systems were analysed, relevant data pertaining to the year 2014 collected, and reasons and factors driving different compliance rates were identified.

Compliance rates were analysed referring to **minimum energy performance (MEP)** and **energy performance certificates (EPCs)**, according to the EPBD items in the following box.

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Box 3– MEP and EPCs requirements

MEP requirements:

- (A1) – application of minimum energy performance standards for new buildings
- (A2) – application of minimum energy performance standards for existing buildings undergoing a major renovation
- (A3) – application of minimum energy performance standards for retrofitted building elements

EPCs requirements:

- (B1) – production of EPCs for buildings or building units that are constructed, sold or rented out to a new tenant
- (B2) – production of EPCs for public buildings occupied by a public authority and frequently visited by the public
- (B3) – showing of or (B4) handing over a valid EPC of buildings or building units that are constructed, sold or rented the new tenant or buyer
- (B5) – inclusion of EP/EPC indicator in advertisement when a building is offered for sale or rent
- (B6) – display of EPCs in large buildings frequently visited by the public (B6)

Source: ICF International-EC DG Energy 2015

As for compliance with MEP, the results of the study revealed that: a high proportion of MS reporting data for new buildings (A1) provided values well above 80%; compliance rates for requirements concerning major renovations (A2) were slightly lower than those concerning new buildings; retrofitted building elements (A3) scored the lowest level of reported data.

The study also identified factors potentially relevant in influencing levels of overall compliance with MEP, including: the mechanisms used for applying the MEP requirements; scope of MEP requirements; the penalty framework; and the support structures.

The findings concerning compliance with energy performance certificates (EPCs) suggest that:

- (B1) – The EPC production in the rental market is less well monitored and controlled than in the market concerning new construction and building sales sectors. The legal systems for checking compliance with the use and issue of

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EPCs in sales and new constructions do not exist for a large proportion of tenancy agreements in most MS;

- Very little data from MS was available to report rates of compliance for production (B2) and display (B6) of EPCs in large buildings frequented by the public. Further sources of information for the study suggest that compliance checking systems for this requirement are quite under developed;
- Very little data on compliance rates was provided by representatives of MS concerning the showing (B3) and handing over (B4) of a valid EPC to new tenants or buyers. Reported data varied greatly, from under 10% in Poland to over 80% for around ten MS;
- Only nine MS reported compliance rates concerning the inclusion of EP/EPC indicator in advertisements in the commercial media. The overall checked data varied greatly across countries, from 13% in Estonia to 100% in Austria.

According to the study findings, compliance levels concerning EPCs seems to rely greatly on the following four elements: the qualified experts' licence to operate; software and database systems in place; prevailing penalty frameworks; and the compliance checking system and characteristics of the independent control system.

Apart from the above-listed factors, which are potentially relevant in influencing levels of overall compliance with MEP and EPCs, other factors affecting compliance rates were identified and referred to in the report as overall **framework conditions**.

Framework conditions **influencing MEP compliance** comprise:

- Political control and localised implementation;
- Social and cultural factors;
- Financial factors including fuel prices and fiscal support;
- Owner occupation;
- Enforcement;
- Costs of compliance to the construction sector;
- Influence of construction sector skills and competence levels on compliance;
- Loss of skilled workers from the sector;
- Knowledge sharing and good practice guidance.

Framework conditions **affecting EPC compliance** include:

- Property type and ownership rate, building density and property values;
- Public awareness and understanding of the EPC;
- Incentives to act;

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- EPC calculation methodology ;
- EPC control system;
- Regional variations.

Factors affecting the building sector and drivers of change

As already suggested in the previous paragraphs, **future directions** for building sector activities derive from the outcomes and interactions of different economic, environmental, cultural, social, political and technical factors, at European as well as at national and local levels. These factors include, among others, energy-efficiency policies, measures and regulations, the strengthening of industrial and modular processes in the building sector (Ellen MacArthur Foundation 2015; Rugiero S. et al. 2014), the transformation of the overall power market in Europe towards one that is more decentralised and interconnected where buildings could become active players in the energy systems (BPIE 2015), infrastructure renewal and the needs of developing “megacities” (ETUC 2013), urbanisation and globalisation processes, customers’ and end-consumers’ demands for sustainably built-environments, etc.

An attempt to organise all possible factors affecting the building sector was carried out at the beginning of 2016 by BPIE, according to which the construction sector and the building component within it are presently seeing robust changes, due to dynamics shaping the overall world economy, referred to as *global megatrends*. The megatrends and drivers of change that can in some way impact on the future of the functioning of the construction value chain have been organised into nine main areas, within which the drivers of change have been listed.

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Table 6 – Drivers of change per megatrends

MEGATRENDS	DRIVERS OF CHANGE
CLIMATE CHANGE	Legislation and support measures to reduce emissions from buildings
	Environmentally conscious consumers
DEMOGRAPHIC CHANGE	Ageing population
	Increasing number of under-occupied dwellings
	Growing number of small and blended families
	Increasing (awareness of) fuel poverty
	Replacement demand of 60% in the construction sector by 2020 – reduced flow of younger workers in the workforce
DIGITAL AND BROADER TECHNOLOGY REVOLUTION	Advanced automation, 3D printing and industrial processes on- and off-site
	Mass adaptation to smartphone technology and connected devices (internet of things)
	Time- and place-independent work
	Non-construction actors enter the construction value chain (e.g. electric vehicles, utilities, ICT)
ECONOMIC CRISIS	Stricter requirements for (mortgage) loans
	Higher caution for investments in buildings
	Social polarisation makes it increasingly difficult for vulnerable people to find decent housing at affordable prices
	90% of social housing is in need of (energy) renovations
ENERGY SUPPLY	Legislation and support measures to reduce energy demands from buildings
	Grid parity and widespread adaptation of renewable energy technologies (e.g. solar systems will be at a grid parity in up to 80% of the global market within 2 years)
	The energy market is changing (decentralisation, decarbonisation. More complex, open...)
	Electrification of heating and cooling
GLOBALISATION	Unfair competition at the international level due to higher standards of the European construction value chain
	Limited access to international markets – reluctance to open public procurement to European construction companies
RESOURCE AND ENVIRONMENTAL DEPLETION	Legislation and support measures (EU, national and regional levels) to increase resource efficiency
	General awareness of resource and environmental depletion, cradle to cradle and local economies
URBAN REDEVELOPMENT	High and increasing degree of urbanisation (more than 2/3 of the European population)
	Threatened biodiversity and increased risk of both flooding and water scarcity because of urban sprawl and soil sealing
	Non-capital cities in Central and Eastern Europe and old industrial cities in Western Europe facing the threat of economic stagnation or decline
MIGRATION	Migration within the EU
	Immigration to the EU

Source: BPIE 2016

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Some more in-depth reflections upon the different drivers of change listed above are provided in relevant documents issued in the last years. For instance, the definition of the baseline scenario on resource efficiency in the building sector carried out by ECORYS (2014) took into account the population factor, household size, floor area for buildings and housing deprivation in Europe as **drivers of the demand for buildings**. Indeed, the study reports that a projection towards 2030 indicates that the European population will continue to grow (by 2030 approximately 21 million more inhabitants than in 2010), and these inhabitants need to be housed and enabled to access services, which leads to a demand for buildings and potential expansion of the built environment. **Household size and dwellings** also provide information about the demand for buildings: during the last two decades (1990-2010), the number of persons per household in the EU-27 constantly decreased. The **total floor area of buildings** trend (derived from extrapolations concerning the average floor area of dwellings, the dwelling floor area per capita and the average floor area of new dwellings) is increasing, while the reduction of the severe levels of **housing deprivation** in Europe relies greatly on renovations, as a way to cope with the issue.

As for the **technological dimension**, according to the ILO (2015) advancement in the overall construction industry relies on three trends affecting both work and employment practices:

- **off-site construction**, which allows companies to control costs, improve quality and efficiency and export better (modular construction techniques, for example, can reduce total construction costs by 30-60%) (Ellen MacArthur Foundation 2015). This is likely to increase in coming years, further integrating with the manufacturing industry, involving the creation of new skilled jobs in manufacturing plants, in the assembly of factory-made components and in the integration of these with traditionally crafted components;
- **green technology** adoption, driven by ongoing urbanisation processes and higher environmental standards (greenhouse-gas emissions, efficient use of natural resources and water), in order to improve the sustainability and the cost effectiveness of materials and construction-related processes;
- **nanotechnology** already applied in buildings (from nano-particle paints used in order to prevent corrosion to thermo-chromic glass to regulate the lighting) which can reduce the costs for companies due to the effects on the usability, versatility, endurance, strength and weight of materials.

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Industrial innovation opportunities

As already outlined, it is widely acknowledged that the development of the building sector relies heavily on **industrial innovation**. From this perspective, it is worthwhile reporting the most recent work carried out by BPIE (2016)¹⁸ investigating different types of **innovation** (product, service, process, marketing and organisational) already being delivered in the construction value chain. The authors' opinion is that such industrial innovations could be further developed so as **to foster structural change** in the sector, which is deemed to be characterised by a low level of innovation compared to others. As a matter of fact, product innovation is considered particularly poor (above all among service industries involved in the construction value chain compared to manufacturing firms), while process innovation is more widely applied (probably due to a larger amount of SMEs providing services in the onsite execution segment).

According to BPIE (2016), on one side the adoption of innovation opportunities depends greatly on a number of interlinked challenges, including: the uncertain economic and policy outlook (which makes it difficult to invest in innovation); the need to manage new risks related to new processes and products of innovative projects; the need to balance collaboration to protect knowledge. On the other side, the extreme diversification of the demand side asking for high-energy performing, flexible, smaller, easy-to-use, lifelong, multigenerational and affordable housing concepts, requires a proactive innovation strategy for European players in the construction value chain. BPIE analysed in depth and from different perspectives (innovation potential, value to be captured, impact on players in the value chain, enabling measures and best practices and pilot projects) four specific industrial innovation opportunities in the construction sector: prefabricated systems for deep-energy retrofits of residential buildings; advanced insulation materials for building envelopes; building interaction with the energy system; and building automation and control technologies.

Innovative solutions concerning *“Prefabricated systems for deep-energy retrofits of residential buildings”* were identified in:

- Customisation of prefabricated elements per project;
- Robotics, 3D scans and simulations to measure the building and execute the assembly fitting perfectly;
- New cooperative business models between design, production, assembly and customers;

¹⁸ This paragraph on Industrial innovation opportunities relies on data, information and reflections presented in BPIE 2016.

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- Third party to aggregate renovation projects.

“Advanced insulation materials for building envelopes” copes through the following innovative solutions:

- Evolution from a single material or product to a system solution that includes fixings, finishing, etc.;
- System solutions leading to reduced labour costs;
- Design and execution guidelines, training, etc., bringing super insulating materials to relevant players in the construction value chain.

To foster innovation in *“Building interaction with the energy system”* the following should be considered:

- Third-party business models aggregating the interactions of the buildings with the energy system;
- Communication interface and steering programme customised to the needs and wishes of the building occupants;
- Smart controls and household appliances enabling building occupants to modulate their energy use.

To conclude with the example provided, innovation potential for *“Building automation and control technologies”* includes the following solutions:

- Organisational and service innovation overcoming the mismatch between the construction sector and building automation to optimise energy consumption with dynamic and self-learning control systems;
- Product innovative solutions integrating building automation in existing buildings;
- Marketing innovation to raise awareness among architects, installers and end-users on energy-saving potential and other benefits such as safety and comfort.

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These changes are related to a wide process of industrialisation in construction.

As analysed by Girmsheid (2005), industrialisation in construction has the following characteristics:

Table 7 – Characteristics of industrial production and parallels to construction production

Characteristics of industrial production	Demands on industrialised construction
Centralised production	Pre-fabrication of components at the factory
Mass production/increasingly variable production	Development of variable basic types
Production based in standardised solutions and manufacture of variations	Standardisation of components but still maintaining flexibility of design
Specialisation	Focus on specific market segments
Integration of planning, production and marketing	Interaction of building design, production planning, production/construction
Optimised processes and organisation	Optimisation of the planning and production processes in terms of automation and mechanisation

Source: Girmsheid (2005)

Reducing structural waste in the built environment

In order to draft prospective tendencies in the building sector it is also essential to refer to the effects of the requirements deriving from the principles of the **circular economy** outlined in the 2015 EC Directive. With regard to this issue the study carried out by the Ellen MacArthur Foundation (2015) drew attention to **structural waste within the built environment**: 10-15% of building materials are usually wasted during construction; 50% of residential dwellers in Europe report living in too much space; 20-40% of energy used in existing buildings could be easily saved; 54% of demolition materials are land-filled. To counteract this structural waste the development of the building sector should seek to cope concretely with the principles of the circular economy, consequently fostering positive effects in terms of GDP and occupation rates (apart from the environmental benefits).

In the framework of the Ellen MacArthur study four main **factors accounting for waste** in the building sectors were identified.

- **Low productivity of the sector**, that witnessed severe stagnation and which is too conservative and cautious about new technologies (thus affecting how builders use resources). The sector is characterised by high levels of skill mismatches, due to the fact that the majority of the companies are locally based

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and fragmented, small or micro-enterprises that find it difficult to access the necessary complex knowledge skills.

- **Under- or over-utilisation of buildings.** On one side, the available data show that in some cases buildings are underutilised (the EU-27 has 25 billion square metres of floor space, a large quantity of which is empty, while during working hours only 35-40% of European offices are used). On the other side, the demand for buildings is increasing (11 million European households are facing severe housing deprivation, as previously mentioned).
- **Energy consumption.** Despite numerous regulations and improvements, buildings are still very energy spending, compliance with the EBPD is still coming up against obstacles (as mentioned above). As already pointed out, for instance, passive and zero-net-energy buildings are already present in segments of the market, but are still a minority of new buildings.
- **End-of-life waste and toxic materials.** Waste generated in the construction sector in Europe accounts for 25-30% of overall waste. It is unattractive due to the presence of toxic elements in demolition materials (such as paints, fasteners, adhesives and wall-covering material), which cannot be easily removed.

Taking into account these factors directly affecting structural waste in the construction sector, according to the circular economy principles **six levers that could transform the built environment** were suggested, concerning:

- **Industrial production and 3D printing** – industrialisation has great untapped potential (moving towards factory-based industrial processes, companies can already reduce costs by 30% and shorten delivery times by 50%); new technologies such as those concerning 3D printing are already revolutionising the construction sector;
- **Energy generation and use**, through better energy efficiency and the distributed production of renewable energy. Apart from alternative construction methods, interventions to reduce energy consumption are already available, from insulation to smart homes (just to provide one example, the use of energy-management tools, such as connected devices, lighting controls or smart thermostats, is growing at a rate of 20% per year). As previously outlined, buildings could also become active players in the power-market systems, as energy producers and not just consumers (BPIE 2015).
- **Shared residential space** – across Europe a large amount of common spaces are proposed in new development projects and in the framework of the growing sharing economy, allowing for the reduction of the costs of communal services and fostering changes in lifestyles, becoming more community oriented.
- **Shared and virtual office space** – new flexible forms of work organisation, including smart working, are increasing in Europe (to safeguard workers’

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wellbeing on one side and the productivity of companies on the other), fostering a better utilisation of buildings and office spaces (currently under-utilised, as mentioned above).

- **Modularity and durability** – the lack of flexibility in building and room configurations represents a barrier to the best use of floor space in the framework of a housing market characterised by changing needs which sometimes prove unsuitable (older people looking to downsize or homeowners looking for retrofitting interventions to change the organisation of their homes). In this scenario, technical tools that can deliver modular interventions in older buildings are also fostering the durability issue.
- **Urban planning** can contain the urban sprawl phenomenon still present in Europe (where urban areas grew 5.75% between 1990-2000 and up to 6.1%, in the period 2000-2006) fostering compact urban growth, a better use of inner-city vacant land and a shift in land-use patterns.

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4. SOCIAL DIALOGUE AND SUSTAINABLE CONSTRUCTION

4.1. Industrial relations in the construction sector in Europe

To better understand the role of social dialogue in support of green building it is necessary to consider **the degree of the social partners' involvement in industrial policies at a general level**. Considering the general state of social dialogue – for all sectors – Eurofound (2014) underlines two key points:

- a. there is a deep influence of the institutional characteristics of the industrial relations regimes at country level;
- b. there is an approach which tends more to the formulation of horizontal policy initiatives rather than in targeted, sectoral ones.

The Eurofound report, adopting a previous analytical framework from Visser (2008), presents five groups of countries in relation to their industrial relations regime:

- a. The Nordic corporatist regime (Sweden, Denmark, Finland) with a highly institutionalised role for social partners, with a high degree of involvement of both employer organisations and trade unions. Participation of social partners in the Nordic countries is mostly mandatory on both tripartite standing committees and ad-hoc committees, as well as in hearings, consultations and conferences. An example of tripartite social partner involvement is represented by the so-called 'growth committees' in the Danish regions, which include not only the social partners, but also NGOs and research institutions.
- b. The social partnership regime in Centre-West Europe (Germany, Austria, Netherlands, Belgium, Luxembourg) characterised by an institutionalised role of the social partners. Policy formulation and implementation involves employer organisations and trade unions. Participation of the social partners is made possible through ad-hoc consultation, participation in high-level groups, standing committee meetings and other instruments.
- c. The liberal pluralism regime or Anglosphere model (United Kingdom, Ireland, Cyprus and Malta) emphasises a more limited role for the social partners and the involvement is driven by specific themes or agendas.
- d. In the polarised pluralism regime (Italy, Spain, Portugal, France and Greece), the role of the social partners is more irregular, highly politicised and the social partners are involved in both standing and ad-hoc committees, but these are not tripartite committees.
- e. It is still unclear whether all or some of the new Member States from Eastern Europe will assimilate any of these regimes (Bulgaria, Czech Republic, Estonia,

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Latvia, Lithuania, Hungary, Poland, Romania and Slovakia). Their industrial relations regimes differ in the strength of unions, the autonomy of the social partners, state intervention, and the place of social dialogue at national level and in companies, and social dialogue is less institutionalised.

Therefore, first of all, regarding the green economy, it is clear that an improvement of the social dialogue about these topics is strictly related to the specificity and the strengthening of general industrial relations regimes at national and sectoral level.

In the specific case of the **construction sector**, regarding the **state of labour and business representation**, Eurofound (2015) underlines three main factors that should be considered to better understand the obstacles and opportunities for social dialogue at branch level:

- a. At national level, a pronounced pluralism characterises the associational systems of both labour and business. This high associational fragmentation arises from a pronounced differentiation in terms of the labour market along numerous well-demarcated occupations (which affects the associational 'landscape' on the side of organised labour) and business activities (which affects primarily the business side) within the sector.
- b. Union densities in the sector tend to be relatively low, due mainly to the high labour turnover and the large incidence of non-standard and migrant work.
- c. Collective bargaining coverage is highly polarised. Although 12 of the 23 countries with available data record high rates of collective bargaining coverage of 80–100%, five countries record rates well below 10%. High collective bargaining coverage can be found almost exclusively among the 'old' Member States (with the notable exceptions of Hungary and Slovenia), whereas extremely low rates are found in the Baltic countries, Bulgaria and Poland. Overall, collective bargaining coverage rates in the construction sector tend to increase with the predominance of multi-employer arrangements and a significant use of extension practices.

In particular, the same report, Eurofound (2015) collects information about the membership and representativeness of the social partners in the construction sector, even if some relevant information is missing regarding considering the countries involved in our project.

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Table 8 – Domain coverage, membership and density of trade unions in construction, 2011/2012/2013

Country	Trade union	Type of membership	Domain coverage ^a	Membership		Density	
				Active members	Members active in sector	Sector density (%)	Sectoral domain density in relation to overall domain density
IT	FILLEA CGIL*	voluntary	SO	353,000	291	25.07.00	>
	FILCA CISL*	voluntary	SO	302,067	n.a.	n.a.	n.a.
	FENEAL UIL*	voluntary	SO	n.a.	n.a.	n.a.	n.a.
	UGL COSTRUZIONI*	voluntary	n.a.	n.a.	n.a.	n.a.	n.a.
	FESICA*	voluntary	n.a.	n.a.	n.a.	n.a.	n.a.
ES	MCA-UGT*	voluntary	O	1,200,000	n.a.	n.a.	n.a.
	FECOMA-CCOO*	voluntary	O	n.a.	n.a.	n.a.	n.a.
	ELA-HAINBAT*	voluntary	SO	19,99	n.a.	n.a.	n.a.
	FCM-CIG*	voluntary	SO	n.a.	n.a.	n.a.	n.a.
BG	FITUC*	voluntary	O	4,12	2,298	1.06	n.a.
	FCIW-Podkrepa*	voluntary	O	6	1	0.07	n.a.
DE	IG BAU	voluntary	O	297,763	n.a. ^d	n.a.	>
	IG Metall	voluntary	SO	n.a.	25	1.05	<
	CGM*	voluntary	SO	89,4	n.a.	n.a.	n.a.
PL	Budowlani*	voluntary	O	12,5	4	0.04	<
	SBiPD*	voluntary	O	8,5	2	0.02	n.a.

Notes: * Domain overlap with other sector-related trade unions. ^a Domain coverage: C = Congruence; O = Overlap; SO = Sectional Overlap; S = Sectionalism; ^b Figure includes non-active members; ^c Union representative contacted refused to give (part of) the requested information; ^d Answer deliberately refused; n.a. = not available; n/a = not applicable.

Source: Eurofound, 2015 (EIRO/EurWORK national correspondents (2013–2014), administrative data and estimates)

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Table 9 – Domain coverage and membership of employers' and business organisations in construction

Country		Domain coverage ^a	Membership				
			Type	No. of companies	Companies in sector	No. of employees	Employees in sector
IT	ANCE*	C	voluntary	20	20	145	145
	ANAPEA*	S	voluntary	66	66	64	64
	CNA UNIONE COSTRUZIONI*	SO	voluntary	65,171	60,172	90	83
	ANIEM*	O	voluntary	6	3,2	60	32
	FIAE*	n.a.	voluntary	n.a.	n.a.	n.a.	n.a.
	CLAAI*	SO	voluntary	107,93	8,35	74,53	1,58
	ANCPL*	SO	voluntary	1200	400	40	20
	FEDERLAVORO E SERVIZI*	SO	voluntary	5,3	1,12	185	12,9
	AGCI SPL*	SO	voluntary	2,788	n.a.	10,41	n.a.
	AGI*	S	voluntary	n.a.	n.a.	n.a.	n.a.
ES	CNC	O	voluntary	n.a.	n.a.	n.a.	n.a.
BG	BCC	O	voluntary	2,036	1,689	27	23
DE	ZDB*	C	voluntary	n.a.	n.a.	n.a.	n.a.
	HDB*	S	voluntary	n.a.	n.a.	n.a.	n.a.
	ZVDH	S	voluntary	7,4	7,4	55	55
	BV Farbe	SO	n.a.	42,754	n.a.	197,5	n.a.
	ZVSHK	S	voluntary	52,5	52,5	334	334
	BV Steinmetze	SO	n.a.	2,1	n.a.	11	n.a.
	BV Gerüstbau	S	voluntary	n.a.	n.a.	n.a.	n.a.
	BI Gerüst	S	compulsory	n.a.	n.a.	n.a.	n.a.
	DA	SO	voluntary	520	430	n.a.	7,5
PL	ZRP*	SO	voluntary	n.a.	21,2	700	31,5
	KPB UNI-BUD*	n.a.	voluntary	n.a.	n.a.	n.a.	n.a.

Notes: Data for 2011, 2012 or 2013 as available.

* Domain overlap with other sector-related employer/business organisations; ** No information on domain overlaps provided; a Domain coverage: C = Congruence; O = Overlap; SO = Sectional Overlap; S = Sectionalism; b Compulsory until autumn 2013; c FIEC suggests 250,000 employees employed by member companies; d Figure doubtful; e Rough estimate provided by EBC; f Figure questioned by EBC; n.a. = not available.

Source: Eurofound, 2015 (EIRO/EurWORK national correspondents (2013–2014), administrative data and estimates)

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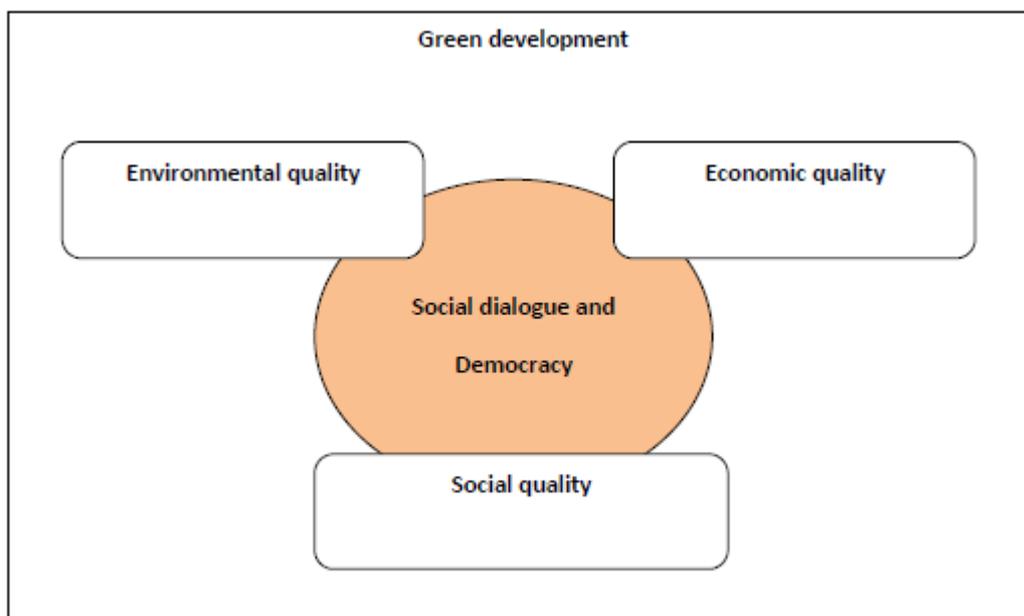
Considering **tripartite dialogue**, the report shows that genuine sector-specific tripartite bodies have been established in eight countries (Belgium, Bulgaria, Denmark, Finland, Malta, Poland, Spain and the UK). The legal basis of these tripartite bodies is either a statute or an agreement between the parties involved and the scope of their activities generally focuses on the following topics: health and safety problems (such as one body each in Bulgaria, Denmark, Finland and Malta); training issues (as is the case of one body each in Belgium, Denmark and Malta, and two bodies in the UK). However, it needs to be considered that other tripartite bodies reports are not taken into account by the Eurofound report because they are cross-sectoral and not focused specifically on the construction sector.

Moreover, several experiences of tripartite dialogue are implemented at local level, with many differences related to the situation of social dialogue and the economic and social context.

4.2. The role of social dialogue in support of the green economy

In the debate between the social partners on the green economy the “environmental” quality of the production is strictly related to the “economic” aspects, especially considering the competitiveness of companies and territorial economies, and to the “quality” of the social life, considering several factors such as: decent work and fundamental rights, quality of work, social inclusion, social justice and social progress. Moreover, at a general level, social dialogue and democracy are considered as basic drivers to address, support and govern sustainable development with the cooperation of government, social partners and civil society.

Figure 1



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Sustainable development for the social partners

The International Trade Union Confederation in the 2nd World Congress (ITUC, 2010) affirms to be committed “to promoting an integrated approach to sustainable development through a just transition where social progress, environmental protection and economic needs are brought into a framework of democratic governance where labour and other human rights are respected and gender equality achieved” and it “recognises the importance of union-led initiatives in building membership in the green economy; green workplace projects to cut workplace emissions and energy use by engaging union members in the challenge of climate change; union-led environmental education and training programmes; and new rights for union workplace environment representatives to information and training on environmental issues. Collective bargaining and collective agreements are important tools for trade unions to facilitate a just transition towards a low emission society. A precondition for democratic involvement of trade unions in climate policies is that the principles of ILO Conventions No. 87 and No. 98 be fully respected”.

UNEP, ILO, IOE, ITUC, *Green Jobs: Towards Decent Work in a Sustainable, Low-Carbon World*, September 2008.

“We define green jobs as work in agricultural, manufacturing, research and development (R&D), administrative, and service activities that contribute substantially to preserving or restoring environmental quality. Specifically, but not exclusively, this includes jobs that help to protect ecosystems and biodiversity; reduce energy, materials, and water consumption through high efficiency strategies; de-carbonise the economy; and minimise or altogether avoid generation of all forms of waste and pollution. [...] Green jobs need to be decent work; i.e. good jobs which offer adequate wages, safe working conditions, job security, reasonable career prospects, and worker rights.” (UNEP, ILO, IOE, ITUC, 2008)

ITUC, *Resolution on combating climate change through sustainable development and just transition*, 2nd World Congress, Vancouver, 21-25 June 2010

Also at European level, the ETUC resolution in 2010 (A Sustainable New Deal) affirms that “from the

Several studies (Eurofound, 2009; 2015; UNEP, 2011; Laurent & Pochet, 2015, Galgóczi (ed), 2012; Vitols & Heushmid (eds), 2012; Coats (ed) 2011) help to better understand the role of social dialogue in relation to the “green economy” and the “just transition” issues.

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The green economy requires the adaptation of institutional and governance frameworks at all levels, considering:

- a. **European social dialogue at general and sectoral level:** promoting regulations, sharing joint strategies, promoting exchange processes between social partners in different Member States, promoting the funding of research and greener activities. In particular focusing on the national differences towards the green economy (Eurofound, 2009), it needs to reduce the East-West and, albeit to a lesser extent, the South-North divide of the level of engagement and mobilisation of social partners and governments which reflects the diversity of the national priority list.
- b. **National social dialogue:** promoting regulations, promoting national plans to improve the green economy, supporting the affirmation of a green debate at branch levels, funding research and greener activities, supporting training.
- c. **Regional level:** in each European country, there are also different contexts and approaches, which need to be considered to evaluate the best way to support a green transition, so great importance is placed on local resource-based approaches and participatory local planning.
- d. **Company level:** supporting changes regarding working processes and final products and services; supporting joint labour-management committees and similar bodies can provide a contribution to identify ways to improve green transitions; specific union representatives (i.e. the “union environmental representative” in Italy and Spain). As analysed by Eurfound (2013) companies are more often likely to manage rather than anticipate green change. Most management approaches, both autonomous and collaborative, are applied to skills development and career and employment security dimensions, and only a few to other dimensions (such as health and wellbeing and work-life balance). However, most companies are likely to use conventional approaches (for example, participation in formal discussions, amendment of current partnership agreements, provision of (traditional) internal training courses, and not engage in eco-innovations in technology, processes and products (for example, new types of training, such as onsite training for large construction sites, innovative partnership agreements with education providers, new ways of involving employees in green change processes).

Certainly, it is important to consider **the relationships among these several levels and their mutual influence**. OECD (2014) analysed the diffusion of several decentralised experiences of training and skills improvement at local and branch level with public-private partnerships, which have grown into systematic policy development. The report underlines that a good **combination of top-down coordinated policies and bottom-up initiatives** can support the greening transition more effectively.

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At the same time, it is important to consider that a “green economy” requires **cooperation between several players** considering the role not only of government and the social partners but also of other institutions, associations and individuals such as: universities and research institutes, vocational schools and private education providers, employment agencies, suppliers of products/services, consultants and experts, costumers’ associations, environmental associations and so on.

4.3. Position of social partners with regard to green building

Focusing the analysis on the orientations of the social partners at European level, we can better understand their convergences and specificities for the improvement of the green economy and green building. Here follows a selection of the most recent recommendations proposed by the social partners.

European Trade Union Confederation (ETUC)

According to the ETUC “**Resolution on a Sustainable New Deal for Europe and towards Cancun**” (2010), the five pillars of a just transition to a low-carbon European economy are as follows:

- Dialogue between governments and key stakeholders, including the social partners.
- Green and decent jobs through investment in (new) low-carbon technologies, R & D and innovation.
- Green skills developed by active strategies of government training, allowing a shift towards a low-carbon economy.
- Respect for human and labour rights: democratic decision-making and the enforcement of these rights are essential to ensure a fair accommodation of interests of workers and communities at all levels.
- Strong and effective social protection systems.

In the recent “**Declaration on industrial policy, energy and the fight against climate change**” (2014), ETUC underlines some important elements to support a just transition:

- 'Just Transition' should be an integral part of the policy framework, which the EU will adopt to organise the transition to a low-carbon economy beyond 2020. The notion of 'Just Transition', which the trade union movement has advocated for many years, aims to integrate employment demands into European and international climate policies – both quantitatively and qualitatively, including training, worker participation, social protection and trade union rights.

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- There can be no question of establishing a hierarchy between maintaining quality employment in Europe and combating climate change.
- Re-industrialisation is a fundamental objective for the future of Europe, but it must not be at the expense of regulations that protect workers and citizens. Low-cost competitiveness based on deregulation and social dumping must be replaced by competitiveness based on quality, innovation and investment. Funding for innovation, research and development in sustainable industrial technologies must be urgently and dramatically increased.
- An ambitious investment plan and a regulatory framework enabling the public authorities to play an active role in industrial redeployment, particularly via state-aid policies that allow the development and long-term survival of industrial projects in Europe, and the jobs associated with them.
- Synergies to be developed between the 2030 climate and energy package and industrial policy: reducing greenhouse gas emissions by 80 to 95% by 2050 (compared with 1990 levels) and financing low-carbon technology pilot projects in Europe
- Clear energy-efficiency targets are the main shortcoming of the European Commission's proposal for 2030
- Common European energy policy: the challenges of supply, energy dependency, environmental protection and access to energy require a policy based on better market regulation, support for innovation and funding for the upgrading of energy generation and distribution infrastructure
- Considering the ETUC document “New Path for Europe” (2013) as a necessary precondition to pursue climate change objectives, considering: cooperation on tax avoidance, evasion and tax havens through comprehensive information sharing and cooperation between national tax authorities and harmonisation of the corporate tax base; financial market reform to rebalance the EU economy; greater cooperation between national authorities, civil services and public authorities to promote long-term quality public services; involvement of social partners in strengthening social dialogue, collective bargaining and worker participation, particularly in relation to economic governance processes at national and EU level, education and training and labour market reform; promotion, respect and enlargement of European social standards so as to fight job insecurity and promote decent, quality jobs.

Beyond the debates on a just transition, which are at the heart of the trade union agenda and have served as a bridge with other social movements to support green

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development, such as the **Spring Alliance** and the **European Environmental Bureau** with the NGO social platform organisations.

In **March 2016**, the ETUC participated in the informal **Coalition for Higher Ambition** calling on EU leaders to act to transform the outcomes of the 2015 Paris Agreement into reality through the development of a robust and ambitious European policy framework, to allow Europe to become a net zero-carbon economy and create the needed jobs, growth and competitiveness. In **January 2016**, the Confederation had already declared its concerns (apart from commitment) regarding the **Paris Agreement**, referring to: a worrying gap between the collective ambition of keeping global warming below 1.5°C and the aggregate effect of the individual contributions; vagueness about finance; the failure to secure a clear commitment from the parties that they will design and implement their climate policies in full respect for human rights and promoting a just transition for the workforce as well as decent and quality jobs¹⁹ (it is worthwhile recalling the previous 2015 ETUC key **demands for the Climate COP21**: legal commitments for all parties based on shared but differentiated responsibilities; equity as a cornerstone; participation of all groups being promoted and acknowledged; respect for human rights and workers' rights²⁰).

In **June 2017**, the ETUC presented its **position on the Energy Union and EU 2030 climate and energy package**²¹. Taking into account recent developments, it reiterated the need for a just transition towards a low-carbon economy, making a number of concrete proposals to implement it.

- As for the acknowledgment of affordable energy as a fundamental right, the ETUC urged the EU to take decisions concerning the prohibition of electricity disconnections, social tariffs for low-income households, energy poverty.
- The Confederation also outlined the need to strengthen the democratic oversight of the electricity and gas markets and to take into account the workers of the various sectors that depend on energy policies in the definition of EU energy policy, beyond the perspective of consumers and producers. In this framework, the ETUC demanded the integration – into the governance of the Energy Union – of a social and employment strategy addressing issues such as employment, social protection, skills and lifelong learning, notably through the national plans for climate and energy.

¹⁹ *ETUC Declaration on the Paris agreement on climate change*, 15 January 2016

²⁰ *ETUC key demands for the Climate COP 21*, Position adopted by the Executive Committee of 17-18 June 2015

²¹ *ETUC Position on Energy Union and EU 2030 climate and energy package: taking stock of recent developments*, Adopted at the Executive Meeting of 14 and 14 June 2017

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- The need for the operational translation of the principles of the European just transition policy was also stressed.
- Additional suggested actions concern the need for European industry to deploy innovative technologies to achieve the energy and climate targets, which also constitute drivers for investments and jobs in the fostered re-industrialisation process of the EU.

Further relevant positions include, among others: the signing of the European Social Partners **Statement on tapping the potential from greening the economy for jobs creation (May 2017)** and the promotion of the Common appeal **The Europe we want: just, sustainable, democratic and inclusive** addressing European leaders on the occasion of the 60th anniversary of the Treaty of Rome (**March 2017**).

Current ETUC positions on a selection of issues relevant to sustainable construction are available on its website.

- From the point of view of **sustainable development and climate change**, the ETUC “demands a sustainable investment strategy to support the decarbonisation of Europe’s industries and economy as well as a strategy to translate the 2030 Sustainable Development Goals into strong policies”²².
- As for **climate change and energy policy**, the Confederation “calls for an EU just transition strategy based on a just transition fund, as well as a governance framework that involves trade unions and encourages MS to anticipate changes facing the workforce due to decarbonisation”²³.
- Referring to the **UN Climate Change Conference (COP 21)**, the ETUC committed itself and its affiliates²⁴ to transforming the Paris Agreement into long-term progress for the planet, for workers and their communities, in order to maintain and create quality employment, promote workers’ participation and social dialogue, provide training for workers, strengthen social protection systems, and respect workers’ rights.
- Furthermore, the ETUC “supports the objectives of the Energy Union and an EU **energy policy** based on solidarity, sustainability, security of supply and affordability, and monitors its implementation carefully”²⁵.

²² <https://www.etuc.org/issue/sustainable-development-0>

²³ <https://www.etuc.org/issues/climate-change>

²⁴ <https://www.etuc.org/issue/cop21>

²⁵ <https://www.etuc.org/issue/energy-climate-change>

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European Federation of Building and Woodworkers (EFBWW)

Like other European labour federations, the EFBWW has been working with other social partners and environmental NGOs to pressure the EU to move more quickly in implementing Europe's 2020 targets.

On **20 June 2011**, the European Federation of Building and Woodworkers (EFBWW) participated in the **Climate Action Network Europe (CAN)**, created in 2011, with the aim of enhancing climate action through EU social dialogue. CAN is Europe's largest coalition working on climate and energy issues. With over 120 member organisations in more than 30 European countries, and more than 700 Non-Governmental Organisations (NGOs) at global level, working to promote government, private sector and individual action to limit human-induced climate change to ecologically sustainable levels.

In addition, the EFBWW is involved in the project **“Build Up Skills”** which is a strategic initiative to boost education and training of craftsmen and other onsite construction workers and systems installers in the building sector, to boost continuing or further education and training of craftsmen and other on-site construction workers and systems installers in the building sector. The final aim is to increase the number of qualified workers across Europe to deliver renovations offering a high-energy performance as well as new, nearly zero-energy buildings.

As analysed by John Calvert (**2011**) while the EFBWW articulates the collective voice of European labour on climate change, as we might expect, there is considerable variation in the degree to which its national affiliates have developed effective responses to the challenge of global warming. Analysing three countries (Germany, Denmark and UK) unions play a major role in shaping the organisation of labour and the training of the workforce – through state-mandated arrangements as in Germany, or voluntary, as in Denmark – and they have also had the ability to influence the way their industries have responded to the challenge of climate change. Conversely, where their role is marginal, as in the UK, their ability to contribute to the development of the climate-change policies of their industry has been, correspondingly, very limited. So, unions can make a positive contribution, but only if they have the resources and influence to support a just transition.

At global level, the European Federation of Building & Wood Workers (EFBWW) with the Building and Wood Workers International (BWI) produced a **Joint Position paper in May 2015** with the aim of addressing green development in these sectors. This report underlines the importance of allocating resources to promote:

- An economically and socially just transition that respects the diverse cultures of the peoples of the world.

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- Vocational training and apprenticeships to assist the dislocated and next generation of workers to be able to use and maintain the new climate smart technology.
- Strengthening and enforcement of all social standards in voluntary forest certification systems, focusing particularly on human rights and workers' rights.
- Collective action to protect workers, their families and communities from the ravenous appetite of neo-liberal trade policies which only consider profits and that hinder local development and promote fossil fuel consumption
- A political agenda that: through regulation, public procurement, and direct financing allows for a quicker uptake in energy- and health-driven building retrofitting and the introduction of locally sensitive building design and construction.
- Supports public investments in energy-smart infrastructure targeted to assist those in high-risk geographic areas or members of higher-risk social groups in order to reduce the dislocation from climate-induced migration.
- Recognises the social injustice of neo-liberal “austerity” plans and the massive global inequality of wealth that results from such policies along with the opportunity costs of not investing in climate-smart technologies, vocational training and human rights.
- Targets aid and assistance to gender-based policies to capitalise on the transition to a lower-carbon lifestyle as an opportunity to promote and achieve gender equity.
- That enacts polluter-pays fees and carbon taxes while reducing costs for lower or no carbon emitters.
- In addition, the report underlines the importance of building alliances in support of tripartite dialogue among governments, employers' and workers' associations, to cooperate with political and community-based organisations.

In **November 2015**, the EFBWW expressed its position in the framework of the **Public Consultation on the Energy Performance of Buildings Directive**²⁶. Starting from welcoming the ambition of the European Commission to act as a facilitator in transforming the European building stock to improve its energy performance and on the terrain of the discussion with the Federation affiliates, several obstacles and challenges were identified to improving energy performance in buildings common across the MS, focusing around four main issues:

²⁶ EFBWW, *Public consultation on the Energy Performance of Buildings Directive. EFBWW POSITION*, Novembre 2015.

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- a) the prevalence of asbestos in buildings that are liable for renovation to improve their energy performance;
- b) the demand for providing sufficient qualifications to employees and companies to secure high-quality renovation outcomes;
- c) the need to guarantee affordable housing after conducting said renovation measures especially to low-income tenants;
- d) the need to enable owners and contractors to conduct renovation measures that address these challenges through adequate funding.

In **April 2016**, the EFBWW and FIEC drafted a **Multi-annual Action Programme for the Sectoral European Social Dialogue of the Construction Industry 2016-2019**²⁷. Under five priorities for the period 2016-2019 the multi-annual programme foresaw the following actions:

- 1. Demographic changes: taking into account an ageing workforce**
- 2. Initiatives for youth employment**
 - a. Updating, promoting and further developing the “Youth initiatives” website²⁸
 - b. Increasing the number and the quality of apprenticeships
 - c. Developing responsible entrepreneurship
- 3. Vocational training**
 - a. Anticipating skills needs
 - b. Validation of informal and non-formal training
 - c. Facilitating the mutual recognition of qualifications
 - d. Exchange of best practices on EU instruments
 - e. “Greening” of the economy and of jobs
 - f. Taking up the challenge of the current refugee crisis through training
- 4. Fostering a culture of H&S**
 - a. Assessment of EU H&S legislative framework
 - b. Better collaboration between stakeholders for improving the quality and safety of earth-moving machines on construction worksites
 - c. Improving the safety culture in our sector

²⁷ <https://circabc.europa.eu/sd/a/c32e6ecd-979c-4b7a-bcff-9b9578e95ea0/Constr-WP-2016-2019.pdf>

²⁸ www.construction-for-youth.eu

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- d. Health and safety for all types of workers
- e. Harmonisation of statistics on H&S
- f. Addressing potential new hazards (e.g. nano-products)
- g. Collaboration with the OSHA Agency

5. Improving the functioning of the labour market

- a. Posting of workers
- b. Combating undeclared work
- c. Fighting against social fraud
- d. Analysis of changes in social-dialogue models
- e. Strengthening industrial relations and the capacity of social partners
- f. Third-country companies in the EU labour market
- g. Internal Market Package

European Construction Industry Federation (FIEC)

In **September 2011**, FIEC published a set of proposals named "Financing Solutions in Housing – A view from the construction industry". The paper identifies the main barriers to renovation activity in the housing stock as inertia, low awareness of the benefits of investment and pay-back periods, difficult access to credit and split incentives between owner and tenant.

In **September 2012**, FIEC joined the **Renovate Europe Campaign promoted by EuroACE**, a European Alliance of Companies for Energy Efficiency in Buildings. The Renovate Europe Campaign, composed of major international companies and trade associations, calls for a roadmap to be drawn up on how to triple the annual renovation rate of the EU building stock from the current 1% to 3% by 2020 and to ensure that the aggregate result of those renovations leads to an 80% reduction of the energy demand of the building stock by 2050 as compared to 2005. Partners in this campaign shared a set of key recommendations to achieve this goal:

- Awareness of the untapped potential in the existing EU building stock to save energy and money, reduce fuel poverty and improve health is growing. But more focus, priority-setting and commitment are needed from decision makers. Most legislation in place at EU and national level currently addresses new buildings. More commitment is needed to implement existing legislation and give existing buildings the same ambitious legal frameworks as those in place for new buildings at EU, national, regional and local levels.

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- Considering that 75% of global energy consumption occurs in cities, local leaders should be given the appropriate means to control related emissions, especially in the building sector, which accounts for 40% of overall energy consumption. Cities can also act as role models for citizens by refurbishing their own building stock.
- The EU has matched its political ambitions for energy efficiency with funding to make it happen. In the funding period 2014-2020, the European Structural Fund is likely to more than double the funding available to co-finance national investments in energy efficiency – including buildings. The European Investment Bank allocated €500 million to energy-efficiency projects related to buildings in 2012, and has pledged in 2013 to support the implementation of the EPBD – including existing buildings. Now is the time to link political ambition and funding with action: Lets Renovate Europe Now.
- Despite the funds that will be made available at EU level, availability of concrete financing models remains the main obstacle in many Member States to unlocking the vast economic, environmental and societal benefits tied up in the EU building stock at local/regional level. The Renovate Europe campaign helps share successful examples of national renovation roadmaps and local funding models that encourage investment in energy-efficient renovation.

In **2014**, the FIEC **“Reaction to the energy efficiency communication COM (2014)”** proposes some recommendations:

- Effective implementation of existing legislation, including taking action on infringements
- Reinforcement of the measures in the Energy Performance in Buildings Directive (EPBD)
- Although FIEC agrees that strengthening market surveillance will help ensure a level playing field, FIEC also stresses the importance of taking into account regional climatic differences that exist within the European Union. In addition, FIEC proposes avoiding prescribing energy-efficiency measures on a very detailed level.
- The EU needs to invest further in research and development in this field, in order to accelerate the uptake of promising new construction methods and energy-efficient products
- Accelerate and finance upfront investments.
- Weighing ambition against cost: energy-saving system costs should not hurt consumers too much

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- The challenge of achieving energy savings should not be placed disproportionately on the construction industry. Other industries – especially energy-intensive industries – must be targeted as well.
- Avoid duplication of existing measures.

In **November 2015**, faced with the forthcoming COP21, FIEC defined its **Manifesto for Climate Change** including *10 Proposals*:

- Promote energy efficiency of Europe’s built environment;
- Strengthen the resilience of cities and territories to climate change;
- Promote low-carbon and climate-resilient infrastructure and buildings;
- Encourage contractual innovation;
- Promote technical and technological innovation;
- Focus financing on sustainability;
- Strengthen network interconnectivity;
- Support training and upgrading of skills;
- Engage with the circular economy.

Immediately after (**December 2015**), FIEC joined the **Global Alliance for Buildings and Construction**²⁹ (launched by France and UNEP during the COP 21) aimed at: supporting and accelerating the implementation of Intended Nationally Determined Contributions (INDCS); strengthening members’ technical, human, institutional and legal capacities; mobilising adequate funding; raising awareness towards building-sector potential in reducing GHS emissions; defining a carbon-neutrality strategy for buildings and the construction sector.

In **January 2016**, FIEC stated its **support for the Circular Economy Action Plan**, stressing that BIM could be a huge boost for the circular economy. In the same year, the Federation drafted – together with the EFBWW – the **Multi-annual Action Programme for the Sectoral European Social Dialogue of the Construction Industry 2016-2019** (see previous paragraph).

The **Clean Energy Package** was welcomed by FIEC (**March 2017**) which nevertheless identified some specific details for further comment and requests for clarification, including the meaning of “industrial production” in construction and an emphatic request for the inclusion of the industry in the proposed Clean Energy Industrial

²⁹ <https://globalabc.org>

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Forum³⁰. In the same month, the Federation expressed its position on the **revision of EPBD** (promoted by the EC-DG ENER). Acknowledging that “this long-awaited document aims to improve the rate of renovation of the existing building stock, by requiring Member States to address residential and non-residential buildings in their long-term building strategies” FIEC “cautioned against premature use of Energy Performance Certificates to measure improvements in energy performance before and after renovation”³¹.

In **May 2017**, FIEC presented its **BIM Manifesto** (Making BIM a global success) which, apart from summarising the challenges posed by it, explains what the industry can do to help facilitate its uptake, asking for support from EU policy makers in order to allow this tool to be adopted by industries and SMEs. The objectives of the BIM Manifesto are: “to establish the (digital) construction industry as a main player in developing key concepts and policies such as smart cities, efficient infrastructure and smart homes (and as a key player in their delivery), using an integrated information platform that gives a holistic view of the construction project in question; to improve the sector’s productivity, competitiveness, customer satisfaction and image, by advocating both; top-down digital transformation, facilitated by the EU and national governments through policy and investment/EU funding; bottom-up digital transformation driven by the construction industry itself (as opposed to other interested players such as the IT industry)”³².

European Builders Confederation (EBC)

Past **June 2016** the **EBC Annual Congress** focused on the use of BIM in SMEs (**Innovation in construction: BIM for SMEs**³³) as an innovative process for the construction industry, highlighting some specific needs for its implementation in Europe:

- addressing the needs and expectations of micro-, small- and medium-sized enterprises in how to design a European standardised approach to BIM;
- promoting the adoption of BIM to facilitate higher energy efficiency and lower life-cycle costs of buildings;
- promoting BIM training programmes that are not based on the use of a specific software, but are rather targeted to guide all construction professionals towards the digital transition of the construction sector;

³⁰ FIEC, Annual Report 2017

³¹ Idem

³² FIEC, Making BIM a Global Success, Brussels, 2017

³³ http://www.ebc-construction.eu/index.php?id=ebc_annual_congress_2016

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- ensuring the soft-landing of public procurements changes with regard to the transition from traditional methods to BIM-based ones³⁴.

Referring to these needs, some comments and recommendations were also outlined:

- Provide a different picture with regard to the use of BIM tools;
- Ensure a soft transition from traditional public-procurement methods to BIM-based ones;
- Integrate SME representation into the EU BIM Task Group;
- Develop BIM tools that can be adapted to the building renovation market;
- Promote the adoption of BIM to facilitate higher energy efficiency and lower life-cycle costs of buildings;
- Ensure SME representation in the standardisation process of BIM;
- Develop well-designed and economically accessible digital model tools for construction SMEs;
- Ensure that the use of digital-model tools will not constitute grounds for exclusion of micro-enterprises/SMEs and will not be prescriptive for particular products;
- Avoid the definition and introduction of the role of BIM manager as solely responsible for the management of BIM projects;
- Provide BIM trainings to construction workers and entrepreneurs in response to industry needs;
- Investigate the position of insurance providers with regard to the use of digital-model tools.

In **November 2016**, the EBC welcomed the **Clean Energy Package** as an important step towards an energy-efficient Europe.

In **2017**, the EBC stated that the **revision of the Energy Efficiency Directive (EED) and the Energy Performance of Buildings Directive (EPBD)** offer a major opportunity for jobs and growth in Europe's SMEs³⁵. More specifically:

- regarding the EED revision, the EBC recommended policy makers: establish a long-term regulatory and financial framework to kick-start a massive retrofitting of existing buildings or the replacement of obsolete and inefficient equipment;

³⁴ EBC, *Building Information Modelling BIM. The road to a SME-friendly implementation in Europe*, Position Paper, 13 June 2016

³⁵ EBC, *Annual Report 2016-2017*, Brussels, 2017

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continue to ensure ambitious energy savings through obligation schemes and alternative measures; take into account energy poverty in private and social/public housing;

- as for the EPBD revision, the EBC recommended: supporting and promoting public and private financing schemes for energy efficiency; ensuring the dissemination of best practices regarding the aggregation of small energy renovation projects; including regular maintenance of heating and air-conditioning systems in the Directive; lowering the kW-threshold indicating the need for a regular inspection and maintenance of heating and air-conditioning systems; ensuring that MS link their financial measures for energy-efficiency improvements in buildings to relevant, transparent and proportionate methods that indicate the improvements in energy performance; facilitating the aggregation of SMEs in groups and consortia; strengthening on-the-job training.

In the same year, referring to the 2015 **Clean Energy Package** and the works carried out by the Environment Committee of the European Parliament in **January 2017** concerning the **revision of the Waste Framework Directive and the Landfill Directive**, the EBC outlined the need to make the transition environmentally, economically and technically feasible so as to avoid the risks for the competitiveness of SMEs due to the lack of accompanying measures, in the face of the new 2030 and 2015 construction and demolition waste targets.

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Belgium

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1. The green building sector: main characterisation

▣ Introduction

It is in the area of energy consumption that lies the greatest potential for reducing greenhouse gas emissions in buildings. Based on this observation the European Commission has included the construction sector in its list of priorities for achieving the targets laid down in the “Europe 2020 strategy” (1). That is why on 19 May 2010 it adopted a directive on energy performance of buildings. That directive implies among others things that all new buildings will have to be near zero-energy buildings from 2021 on (3).

The challenges and hence the opportunities for construction companies are numerous. The size of these challenges in connection with cutting greenhouse gas emissions from buildings is a consequence of the poor energy performance of Belgian buildings. The McKinsey report (Pathways to world class energy efficiency in Belgium) concludes that Belgian energy consumption per square meter is well above the EU average (72% gap with Europe as a whole and 51% with our neighbouring countries). Due to the climate in Belgium our heating needs are nevertheless slightly lower than those of our neighbours. The difference in consumption is therefore related to the nature of the Belgian building stock (older, less compact, less well insulated). Accordingly the greatest potential for energy savings is in existing buildings (2).

▣ Features of the construction sector

◆ General

The construction sector embraces various operations: house building (structural and finishing), industrial buildings and civil engineering (soil, roads and water works), as well as services (including project design and management) and the manufacture of materials and building components. The construction sector in Belgium generates 46.6 billion euros in turnover (22% in the Walloon Region, 11% in the Brussels Region and 66% in the Flemish Region). This sector creates wealth in excess of 16 billion euros, i.e. a share of approximately 5% of GDP (6).

The size of the businesses is in proportion to the scale of the projects on which they are working. We have seen nevertheless that two third of the businesses have no employees. 21% of them have 1 to 4 employees. Only 1% of companies have more than 50 employees. Small businesses operate mainly in the residential market. Medium-sized business dominate the non-residential market, and large companies are capable of taking on large infrastructure projects as well (7).

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The construction sector operates mainly on a local basis; this manifests itself in more stable employment than other industrial sectors. The sector is less sensitive to changes in competitiveness. Large companies do operate internationally because an export market exists for large-scale construction and infrastructure projects.

Competitive positioning plays an important part especially in the manufacture of building materials, both within Europe and internationally. Advanced products are often imported at present. Some materials for which mass production is becoming significant, e.g. photovoltaic panels, are relocating to countries such as China where manufacturing costs are a great deal lower (7).

Competition between manufacturers of building materials is intense and based primarily on cost and price considerations. There is however sluggish evolution noticeable towards a more value-driven market. This means that manufacturers compete on the basis of the value of their products and that the market is prepared to pay more for products of better quality. This therefore brings about greater opportunities for niche players to specialise in offering more complex sustainable products (8).

◆ Challenges

□ Innovation

Innovation in the field of sustainable building can exist at two levels:

1. products and processes and
2. the manufacturing process. The latter entails an approach that focuses more on using, upgrading and refurbishing buildings and infrastructure.

There is evidence of cross-sectoral innovation to an increasing extent, in other words: technologies from renewable energy for instance are being incorporated in building components. Thus solar cells for instance are built into roofing.

Innovation occurs mostly in knowledge centres. On the other hand, the application of this innovation in construction companies themselves and its permeation to the demand side is proceeding rather sluggishly. This is partly attributable to the large number of small businesses that do not always possess the trained employees or the resources to implement new technologies.

There is evidence of a rising level of automation and increasing use of prefabricated materials, because this offers greater benefits of scale and allows greater control of working conditions (e.g. the weather). This evolution is certainly of importance in green

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building because the higher environmental performance depends to a large extent on assembly accuracy. An additional benefit of using prefabricated materials is that technological innovations are easier to disseminate, even with small businesses (8).

☐ Sustainable building

The concept of sustainable building entails consideration for the environment (e.g. energy efficiency), health (e.g. air quality) and social aspects (e.g. independence for the elderly).

Green building is a sub-aspect of sustainable building in which the focus is on the environmental dimension. The aim is to reduce the need for natural raw materials such as energy, water, land, non-renewables, etc. and the overall environmental impact of buildings and infrastructure. The life cycle approach is key to this. Green building embraces the entire chain of the construction process and the life cycle of the building, from design to demolition of the buildings, from developing and manufacturing building materials to recycling them.

Because the implementation of green building is possible on any scale and is appropriate in every activity, all companies operating in the construction sector are potentially engaged in green building, along with conventional business activities.

Various studies have attempted to identify the size of this share in practice. A survey with Building Confederation members in 2010 revealed that 70% of businesses are active in sustainable building (4).

The energy efficiency of residential buildings in Belgium is currently among the lowest in Europe. The total energy consumption of a home is accounted for mainly by consumption for heating, the ventilation or air conditioning system, hot water consumption and electricity.

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2. National political framework for green building

■ Introduction

As a result of different state reforms (six in total since 1970), Belgium is a federal state with three communities, three regions and four language areas.

- ◇ Three Regions (Flemish Region, Brussels Capital Region and Walloon Region)
- ◇ Three Communities (based on the language spoken: Dutch, French and German)
- ◇ Four language areas:
 - Dutch language area
 - French language area
 - German language area (with specific linguistic facilities for French-speakers)
 - Bilingual Brussels-Capital area

Just like the federal institutions, every community and every region has its own political institutions. Every community and every region has legislative powers for the matters prescribed by the Belgian Constitution. The matters for which a community and/or a region has legislative powers have been modified as a result of the different state reforms.

Concerning Green Building, these matters include (among other things):

1. Training and education: from nursery school to university, including scholarships, via the introduction of compulsory education (communities)
2. Policy regarding economy, employment and energy: includes public support for business, employment policy, distribution of electricity and natural gas, exploitation of new energy sources and promotion of rational energy use (regions)

The legislative powers regarding education, training, energy-efficiency and renewable energy sources reside with the local authorities. The following text is meant to create a national political framework (for Belgium) by identifying the initiatives undertaken by the different regional authorities (communities and regions).

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▣ National regulatory and legislative framework

In the environmental field the 20-20-20 climate targets have been formulated by the EU. In concrete terms it is being postulated that by 2020:

- ▣ emissions of greenhouse gases will be cut by 20%,
- ▣ a 20% share of energy end-use will be from renewable energy sources and
- ▣ there will be a 20% saving in energy demand.

The construction sector can make an immense contribution to help society meet these targets. That means, among other things, that there will have to be an increase in the number of qualified workers. The transposition of these developments into appropriate craftsmanship and the qualifications they entail, training in short, perhaps constitutes the greatest challenge.

On 23 January 2008, the European Commission published its climate package meant to put into practice the 20-20-20 goals. For Belgium, this means that by the year 2020 (11) (12):

- the part of renewable energy in the gross final energy consumption will have to be reduced by 13%;
- the primary energy consumption will have to be reduced by 18%;
- the greenhouse gas emissions will have to be reduced by 15% in comparison with 2005 in the industries that are not covered by the European Emissions Trading System (non EET industries).

◆ Renewable energy

The European Directive 2009/28/EC of 23 April 2009 on the promotion of the use of energy from renewable sources imposes a binding goal to each member state concerning the part of renewables in the final energy consumption that will have to be achieved by 2020. Belgium has to achieve a goal of 13% of renewables by 2020. That is a very ambitious goal, knowing that in 2005, only 2,2% of all energy had a renewable origin.

The Belgian “National renewable energy action plan” was submitted to the European Commission on 1 December 2010. The federal government and the three regions compiled the plan. The plan describes how Belgium can achieve the target on renewable energy by 2020.

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This target is binding. The measures, target percentages per sector (electricity, heat and transport) and the interim targets are only indications. The existing measures are assessed on a regular basis and – where necessary – additional measures are introduced to eliminate any problem areas (arising).

The action plan describes the existing policy measures and regulations in respect of renewable energy and new measures in prospect: a minimum share of renewable energy in buildings, quality accreditation for installers and additional support for green heat. These measures are undergoing further elaboration.

In order to optimise regional policy, the target for Belgium is being transposed into a target for each region. Accordingly, each region can employ its optimum mix of renewable energy sources and tools (9).

The Walloon Government decided to set the European goal of getting 20% of all energy from renewables as a goal for the Walloon Region too (13). Regarding the greenhouse gas emissions reduction, it aims at a reduction by 30% compared to 1990 (14).

Flanders imposes itself to get 13% of all energy from renewables by 2020, and to reduce the energy consumption by at least 9% by 2016 (based on the average final energy consumption 2001-2005). Flanders also wants to reduce the greenhouse gas emissions. Two central elements to these goals are the Flemish climate policy plan 2013-2020 and the Flemish adaptation plan (15). Moreover, a lot of attention is spent on the good implantation of the wind turbines. The wind energy industry has set itself the goal to generate 1.500 MW in Flanders and 2.800 MW in the North Sea using wind turbines by the year 2020 (16).

The directive also contains provisions that oblige the member states to fix minimum levels for the use of renewable energy in new buildings. In Flanders, this obligation applies to the offices and schools that belong to public authorities since 1 January 2013. For all other new and thoroughly renovated buildings, the obligation applies since 2014. The European directive 2010/31/EC on the energy performance of buildings obliges the European member states to ensure that, by the year 2021, all new buildings are near zero-energy buildings (nZEB). For buildings that belong to the public authorities, this obligation will apply from 2019 on.

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◆ Energy efficiency

Consistent with the European directives, Belgium submitted its third “National renewable energy action plan” on 30 April 2014 (20). Apart from the promotion of renewable energy, efforts have to be made in the area of energy efficiency (reducing the consumption of energy and thus reducing the greenhouse gas emissions) in Belgium. The construction industry will have an important role to play in this. The action plan shows the federal and regional initiatives and policies, among other things.

▣ Relevant institutional initiatives in support of sustainable building

The passage below gives a short overview (relevant for the construction sector).

▣ On the federal level (20):

- ◆ “Energievreters”: this website (Dutch: www.energievreters.be/ French: www.energivores.be) is a complex, but practical internet tool to calculate CO2 emissions. There is a specific module for the construction sector: windows, roof insulation, wall insulation, lighting.
- ◆ MPV-database of building materials: The Federal Public Service Health, Food Chain Safety and Environment puts a database at the manufacturer's disposal, allowing them to indicate the full life cycle of their building product. Thanks to this database, it will be possible to take into account the so-called embedded energy, i.e. the energy it takes to produce, install, maintain and remove a building product. The better buildings can be insulated, the more important this embedded energy will become.
- ◆ Tax credit Roof insulation
- ◆ Expenses for the renovation of inexpensive rental homes

▣ Walloon Region (20):

- ◆ In accordance with the exigencies contained in Directive 2010/31/EU on the Energy Performance of Buildings, Wallonia agrees that, from 2020 on, every newly built building will be "Net Zero Energy".
- ◆ The Energy Advice Procedure (EAP) that was launched in 2006 is meant to audit existing buildings in answer to a voluntary action of the owner or tenant. After a visit by an authorised auditor, the applicant receives an advice as well as a certificate.

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- ◇ Certifier and EPB certificate: the certification of existing residential buildings and the authorisation of the different parties concerned (certifiers and training centres) are organised in a decree that was adopted by the Walloon government on 3 December 2009 and that was published in the law gazette on 22 December 2009. The candidates have to meet certain conditions (degree, experience). Depending on their profile, they also have to participate in certain trainings organised by authorised centres, and, in certain cases, they have to pass an oral and a written test. The minister authorises the candidates who participated in the training and who passed the examinations, if required.
- ◇ Green certificates: these certificates (that act as a kind of ‘allowance’) are distributed for ‘green’ power. The certificates are authorised by Europe and can be traded on national and international markets. In Belgium, green certificates have been used as the publicly supported tool for the production of renewable energy since 2002.
- ◇ Marshallplan 4.0 (21)
 - ▣ 'Housing' and 'Energy' allowances and loans
 - ◇ The ECOPACK: instalment loan with an interest rate of 0%, mainly for the financing of works that qualify for the 'Energy' allowance
 - ◇ The RENOPACK: instalment loan with an interest rate of 0%, mainly for the financing of works that qualify for the 'Renovation' allowance
 - ▣ Energy audits and study (AMURE)
 - ▣ SOLTHERM focuses on the expansion of the solar water heater market in Wallonia by means of the attribution of an allowance for the installation of a solar water heater and by means of training for the installers.
- ▣ Flanders (19)
 - ◇ Regulation on energy performance certification (EPC)
 - ◇ Energy performance exigencies in the Flemish housing code
 - ◇ Allowances and tax credits for energy saving investments
 - ▣ Property tax cut for new buildings with a lowered E rating (the E rating is a measure of the energy performance of a building and its fixed systems

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in standard conditions. The lower the E rating, the more energy efficient the building is).

- ▣ Roof insulation allowance
 - ▣ Flemish renovation allowance: by means of the renovation allowance, the Flemish government aims to support owners who want to renovate their own house of at least 25 years old or who want to convert an existing building into a home. The allowance is calculated in function of the category of the works and adds up to 20% or 30% of the invoice amount taken into account.
 - ▣ The Flemish improvement allowance: apart for the Flemish renovation allowance, there also exists an improvement allowance. This allowance is meant for people with a modest income.
 - ▣ On 29 November 2013, the Flemish government determined the E rating and the set of requirements buildings will have to comply with by the year 2021 in order to meet the nZEB level.
- ◇ Help of energy consultants
 - ◇ Green power certificates
 - ▣ Brussels (20)
 - ◇ EPB: The range of measures prescribed in the EPB edict can be summarized in three main categories:
 - ▣ The component "Technical EPB installations": the technical facilities of a building can be an important source of energy savings. In order to guarantee a minimum level of energy efficiency, heating and air conditioning systems have to meet certain requirements and are subject to different controls.
 - ▣ The component "EPB works": for a construction or renovation project for which an urban planning permit is required, a property has to meet certain EPB exigencies aimed at a high energy efficiency and a healthy interior climate.
 - ▣ The component "EPB certificate": this allows prospective tenants and prospective owners to compare properties based on their energy efficiency. Every residence and every large office space that is put up for

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sale or for rent has to have an EPB certificate containing this information.

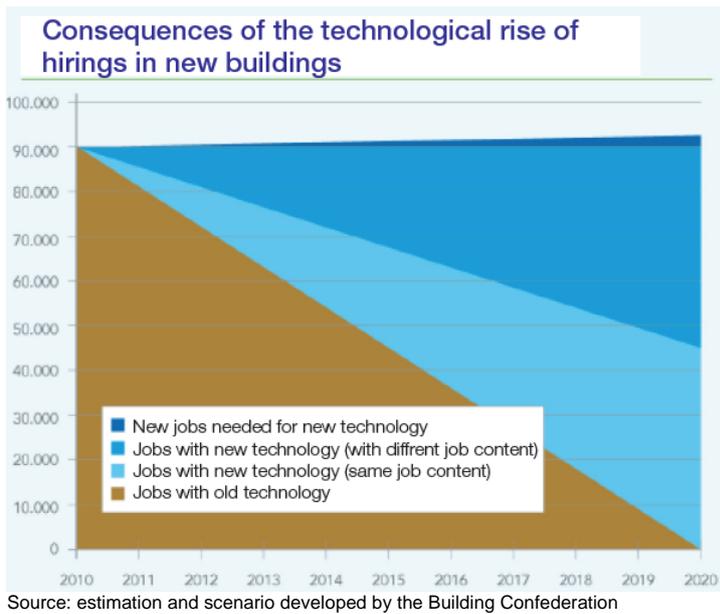
- ◇ Renovation allowance: the allowance for a renovation of the living environment regards works that guarantee stability, safety and health or that modernise the house and increase its comfort level. This allowance is meant to help owners improve the habitability, basic comfort and safety of their house.
- ◇ Energy allowances: in order to rationalise the use of energy, allowances have been created following these three priorities:
 - ▣ Audit: detection of the heat loss points in a building
 - ▣ Insulation: guaranteeing the insulation of the building envelope
 - ▣ Heating: installation of a heating system and an efficient system for the production of warm water that is adjusted to the needs

3. Major trends in the green building economy

- ▣ Economic trends in the construction sector

In the context of the 2020 strategy requiring by the EU to be implemented, we can conclude that all jobs that are involved in new build will be green jobs. All new buildings will in actual fact require to be nearly energy neutral. Changes in the construction process which will be necessary to produce these nearly energy-neutral homes will also have knock-on effects on work content. In passive buildings for instance there is very little, if any work for a heating installer, whereas in a 'traditional' building installing heating is a significant business. However installing ventilation is optional in a traditional house but all the more important in a passive dwelling. The heating-ventilation job content in new build will therefore, as part of the greening of the construction sector, shift from heating to ventilation (1). In addition to ventilation with heat recovery (as used in a passive house) there is also the possibility of using demand-driven ventilation as an alternative. These demand-driven systems are more likely to be installed by electricians.

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A survey conducted by IDEA Consult on behalf of the Building Confederation reveals that the attitude of contractors to sustainable building varies from passive (it must be done) to highly active (wanting to follow trends). The most active attitude can be found among contractors who carry out installations. In addition to this it is also evident that construction companies have a demand for additional training, both trade-related and non-trade-related courses. It is also evident that many contractors are still anxious about the price of sustainable building (4).

The McKinsey report (Pathways to world class energy efficiency in Belgium) concludes that Belgian energy consumption per square meter is well above the EU average. The difference in consumption is therefore related to the nature of the Belgian building stock (older, less compact, less well insulated).

The data in **Errore. L'origine riferimento non è stata trovata.** suggests that only 23% of buildings in Belgium were constructed post 1981.

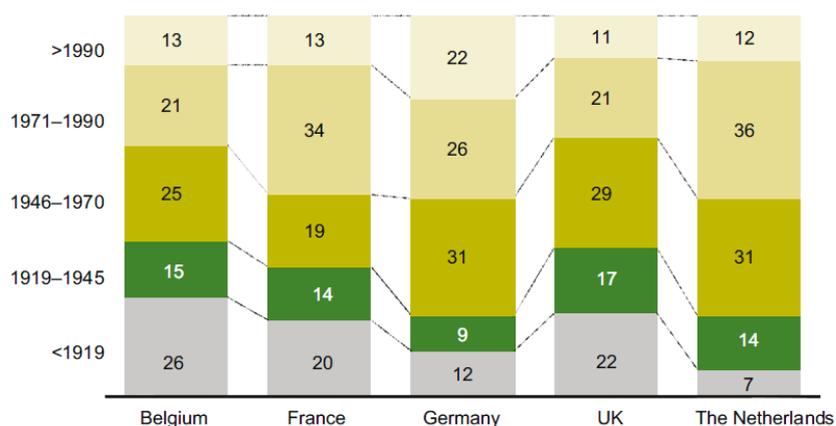
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Table 1 - Age of building stock in Belgium (2011) (17)

Number of buildings constructed	Single family dwellings			Multi-family dwellings	Others	Total	%
	TH	SDH	DH				
before 1900	282,766	163,563	135,160	11,335	127,251	720,075	16%
from 1900 to 1918	183,445	68,869	42,050	7,986	48,099	350,449	8%
from 1919 to 1945	296,869	141,396	88,255	15,310	90,228	632,058	14%
from 1946 to 1961	170,668	174,034	145,433	24,795	110,326	625,256	14%
from 1962 to 1970	71,454	101,265	161,958	25,876	96,652	457,205	10%
from 1971 to 1981	77,456	116,383	272,954	23,899	115,110	605,802	14%
post 1981	81,551	156,598	516,652	51,586	196,934	1,003,321	23%
Total	1,164,209	922,108	1,362,462	160,787	784,600	4,394,166	100%

The table that follows allows us to make a comparison with some European countries (data from the year 2005). It reveals that only the building stock in the UK is comparable to the situation in Belgium.

Figure 1 – Age of building stock by period in some neighbouring countries (2005) (18)



Accordingly the greatest potential for energy savings is in existing buildings (1).

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▣ Employment trends in the construction sector

◆ Personnel turnover

▣ Introduction

This research by Constructiv is based on a comparison of the active construction sector workforce as at 30 June 2013 with the construction sector workers who were active on 30 June 2014. As a result of this we can draw a distinction between various categories:

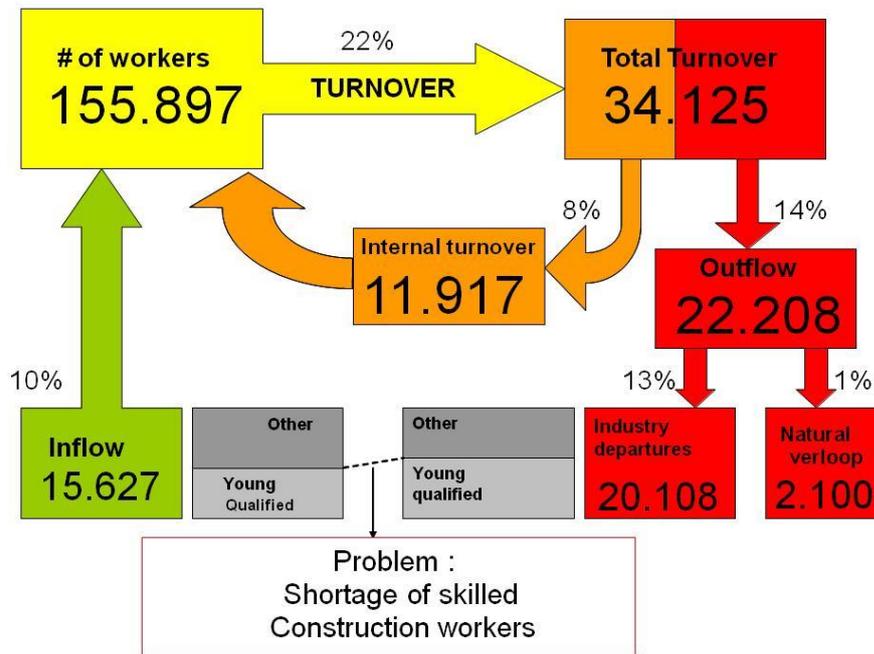
- same construction employer: workers who have not changed employers (SEC)
- different construction employer: workers who have changed employers, but who are still active in the construction sector (DEC)
- outflow: workers who are no longer present as workers in the construction sector. There can be various reasons for this. Accordingly, a worker might be active in a different sector on 30 June 2014 or not able to be found on account of death, (early) retirement, unemployment, etc. (outflow)
- intake: workers who were not active in the construction sector on 30 June 2013, but who are present as workers on 30 June 2014, these people in other words have started work in the construction sector (intake).

The source of this research is the database which Constructiv has at its disposal. This database is fed with information from the Crossroads Bank for Social Security. It contains all the information about employment of workers in the construction sector (Joint Committee No. 124).

The turnover in the workers' population from June 2013 over a one-year period is shown in the chart below (note: the difference in number of employees compared with the table in the following passage (Table 2 Evolution in workers by age) is due to a different measuring point: in this study employment was measured on 30 June 2013, in the following table regarding employment (Table 2 Evolution in workers by age) the measurement was taken in December 2013).

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Figure 2. - schematic outline of turnover in the construction sector (figures for 2013-2014 – Source Constructiv)



Of the estimated 156,000 workers employed in 2013, around 34,000 have changed employer (22%). Of these 34,000, around 12,000 have changed employer within the sector. Around 22,000 workers (14%) have left the sector. This includes some 2,000 people under natural wastage: they are on (early) retirement, long-term unfit for work, deceased, etc. The remaining 20,000 workers have transferred to another sector, are unemployed or have changed status (clerical or self-employed).

The origin of intake has been determined based on previous research. It was noted that out of the total intake, 35% originated from a training system (or through temporary work).

- 14% came from a sandwich course system (JLW, ABO, IBO).
- 12% came from basic training for jobseekers.
- 12% came through a temporary contract in the sector.
- 20% came from construction education.
- 42% came from a combination of the above systems (e.g. a temporary contract after construction education).

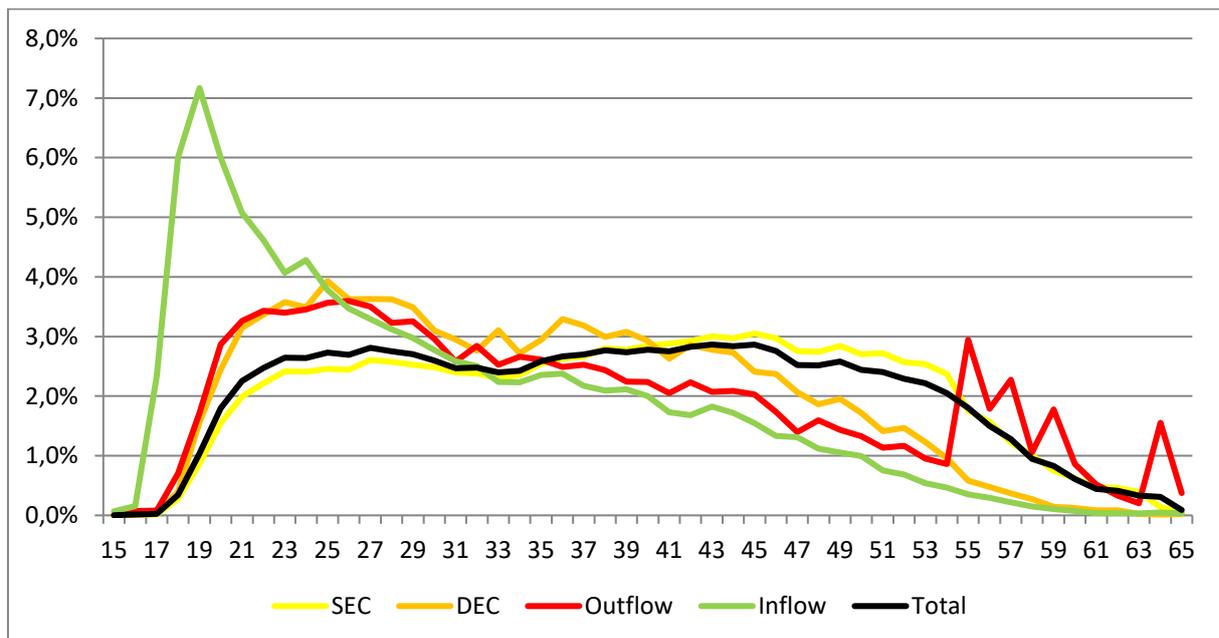
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24% are re-entrants, i.e. workers who have come back to work in the construction sector again. The remaining intake (41%) consists of newcomers who cannot be traced. In concrete terms this undefined intake consists of individuals who cannot be tracked down in construction training courses. Accordingly, these are possibly young people who have attended a training course outside construction education (catering, engineering, etc.). They could also be older employees who have come in from another sector. What is indeed clear is that these people have no experience within the construction sector and/or did not have the benefit of basic training that prepares for work in the construction sector. This group therefore lacks any construction-related qualifications.

☐ Turnover by age

Figure 3: age distribution of turnover in the construction sector, relative numbers (figures for 2015) shows the relative age distribution for the various subpopulations and for the total population. The age distribution for the “same construction employer” approximates the age distribution for the total population. The “outflow” and “different construction employer” subpopulations have a relatively young population. For outflow there are naturally many older construction workers, who take (early) retirement or die. Intake naturally has a very high proportion of young people, but this is partially negated by young people who leave.

Figure 3: age distribution of turnover in the construction sector, relative numbers (figures for 2013-2014 – source Constructiv)



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◆ Personnel evolution

The table below shows the number of workers employed in the construction sector (Joint Committee no. 124) by age category.

Table 2: Evolution in workers by age (Source: Constructiv)

Age	2009	2010	2011	2012	2013	2014	2015
15-19	475	2,632	2,673	1,990	1,503	1,212	1,098
20-24	17,612	19,585	19,888	18,891	16,399	14,911	13,520
25-29	21,923	22,464	22,811	22,426	21,037	20,404	19,700
30-34	20,682	20,510	20,827	21,234	20,402	20,041	19,462
35-39	20,685	20,424	20,740	18,993	17,976	17,916	17,971
40-44	22,180	21,857	22,196	20,845	19,546	18,605	17,813
45-49	21,836	21,284	21,613	21,292	20,153	19,596	18,906
50-54	19,127	18,454	18,739	18,759	18,279	18,333	18,333
55-59	12,533	10,937	11,106	11,788	11,999	12,215	12,705
60-65	4,789	3,821	3,880	4,280	4,268	4,274	4,514
Total	161,843	161,968	164,743	160,498	151,562	147,507	146,037

It is clear that the total number of workers decreased significantly in the last few years.

▣ Skill needs and training

◆ Institutions responsible

▣ Formal education

◆ Different players

The role of government

The authority for education rests with the regional governments (Flemish Community, French Community and German-speaking Community). The department for education and training will draft a decree. At this preparatory stage the competent minister is required to enlist the advice of the various third parties (e.g. in respect of funding, validity of legislation, etc.). One of these third parties is the Education Council (called “Vlor” in the Flemish Community, “Conseil pour l’enseignement” in the French Community). This council works independently of the department for education and the competent minister. Once this Education Council has had the opportunity to formulate a recommendation the decree can go before parliament. After that authority rests with the executive (the Department for Education) to implement policy. During this implementation the policy will be assessed by schools and inspectorates.

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Networks

Freedom of education is a key component of the Belgian constitution. Education is organised by various networks. This guarantees the schools' right to work out their own teaching approach. There are three major networks:

- Community education
- Official subsidised education (organised by municipal authorities or provinces)
- Free subsidised education

◇ Development, accreditation and regulation of qualifications and skills

The first step consists of professional competence profiles being drawn up. These profiles are to meet the needs of the construction industry. They are validated by management and the workers and form the basis for learning outcomes in the various paths that can be followed by young people. Professional competence profiles are developed using an analytical procedure. The source material is compiled first: manuals, training courses, literature, as well as interviews with businesses and experts. A draft of the professional competence profile will be prepared next. This draft will be presented to management and workers as well as experts in the field. This enables adjustments and changes to be made. Finally the document is presented to all relevant management and worker representatives. Minor amendments can still take place after this last phase. This process ensures that management and workers endorse the content of the professional competence profile.

The second step is to set up training profiles. These profiles embrace the necessary knowledge and skills that a construction sector worker will need to possess at the start of his career. The aim of a training profile is to develop a tool, validated by a specific sector, that will enable VET (vocational education and training) to be consistent with the reality of the labour market.

The third step is to set up learning programmes. This is usually carried out by the various networks. The curriculum consists of:

- General trades
- Practical trades
- Work placements

Colleges (or the networks) develop the learning programmes. The government lays down the development targets and final attainment levels. However, given that the

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professional competence profiles have been drawn up and validated by management and workers and that these profiles constitute the source and reference material that determines these final attainment levels, management and workers will have considerable influence on the learning programme.

The way in which these objectives are achieved is the responsibility of the college or the training centre.

◇ The structure of VET and qualifications

Competence is related to performance of workplace activities in a circumscribed vocational activity and is based on an integration of knowledge, skills and attitudes. It is assumed that a student will rely on knowledge (e.g. properties of insulation materials), skills (the ability to install insulation material) and (work) attitudes (a degree of precision, efficiency, collaboration, etc.). Final attainment levels are described in terms of competencies: a student is able to complete a certain task, a student knows certain facts and possesses certain attitudes.

A qualification is an exhaustive set of competencies for which someone can obtain an official certificate. A qualification defines the competencies that are relevant for a specific job, community post or access to an education system. Different routes exist to obtaining qualifications. These routes are set out in the passage that follows.

All education systems focus on three areas:

- General training: how to function in society and how to develop as an individual;
- Preparatory training: preparation for further education;
- Preparing for the labour market: acquiring competencies that can be used to find a position in labour market.

All colleges have to pay attention to these three areas. However, the emphasis placed on any of these areas can differ in the various education systems. Special Needs Education focuses almost exclusively on training aimed at work. On the other hand ASO [General Secondary Education] focuses almost entirely on preparation for further education.

The 6 years of secondary education (between the ages of 12 and 18) is divided into three 2-year levels. Level one (years 1 and 2) is the same in all education. In level two the student will choose a certain area. In level three the student will opt for a specific field.

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Special needs secondary education

This is an education system aimed at students with a physical disability, learning difficulties or developmental disorders (such as ADHD, autism, etc.). Students can obtain a qualification by attending a training course in this system.

Vocational secondary education

The traditional route to obtaining a qualification in the construction sector is full-time education: vocational secondary education. This education system prepares young people for employment as qualified employees and contributes towards vocational and social development.

Technical Secondary Education

The aim of this education is twofold: preparing students for the labour market, but also preparing them for further education. The syllabus pays more attention to design than just carrying out tasks.

Adult Education

Adults can attend training courses in centres for adult education (CVO in Dutch).

Sandwich courses/apprenticeships

The aforementioned education systems consist of full-time education in a college (although set periods are spent in a company as well). Young people who have reached level three can also choose a sandwich course. In this system the youngsters spend the majority of their time in a company (60-80%), the rest of the time is spent in a training centre.

◇ Ratio between the various routes

If we look at the number of apprentices in the various training systems, we can see that the ratio between the various routes is as follows:

- Special needs education: 20%
- Vocational and Technical education: 40%
- Industrial Apprenticeships: 20%
- Apprenticeships: 20%

(source: Syntra, IFAPME, Constructiv statistics)

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Accordingly, vocational and technical education constitute the greatest potential intake channel, the other routes can account for proportionally equal intakes.

◆ Advanced vocational training for workers

▣ Constructiv

The Fund for Vocational Training in The Construction Industry (fvb-ffc Constructiv) was set up in 1965 as a Fund for Social Security and later on was integrated in Constructiv, tasked to promote and support training of present and future workers in construction and to safeguard the quality and results of their training.

The importance the sector attaches to training was already made clear from the start by the unique financial arrangements for this fund. Fvb-ffc Constructiv was and is in actual fact financed by a percentage that all construction companies pay on payroll payments. In this way the cost of training is fully consolidated.

The history of fvb-ffc Constructiv is characterised by a number of fundamental changes.

- Initially fvb-ffc Constructiv operated in the structural construction sector only. The finishing sector was added to this in 1987.

- In the early years of fvb-ffc Constructiv the main emphasis was directed at campaigns involving young people. Since the nineties its operation has been based on three pillars: collaboration with education, retraining of jobseekers and in-service training for construction sector workers.

- Furthermore, fvb-ffc Constructiv is also working on upgrading the image of construction vocations and on raising awareness of safety aspects in the construction industry. Massive efforts were put into both areas, not only for, but also by the companies and workers in the construction sector.

As of the 1st of October 2016, fvb-ffc Constructiv became part of a larger organisations: Constructiv.

The Joint Committee for Construction is the ultimate client for Constructiv. Thus, among others, it appoints members of the Constructiv Board of Management, in which employer and employee organisations are represented.

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The Constructiv structure of permanent employees moreover can count on input from both regional and sectoral advisory groups that include representatives from the sector and training partners.

The three pillars are:

- collaboration with construction vocational education;
- support for jobseekers' training;
- stimulating in-service training for construction sector workers.

Constructiv is the point of contact in this regard for all the target audience concerned. Constructiv is and remains a federal sectoral Fund. It is therefore the Board of Governors that bears ultimate responsibility.

Given that “education” and “training jobseekers” are regionalised matters, sectoral terms of reference are utilised in which implementation is carried out by the regional guidance groups:

- the sectoral terms of reference lay down uniform sectoral objectives such as:
- increasing intake into construction training courses;
- increasing training quality;
- increasing flow to construction employment;
- reducing the number of dropouts.

Taking account of these sectoral terms of reference, subsequent elaboration will be assigned to the three regional guidance groups. Every effort will be made here to achieve optimum coordination with the regional governments on these matters. There are three full-fledged guidance groups: Flanders, Brussels and Wallonia. In general terms they will consult mutually where necessary. Directing and managing employee training courses remains a federal matter. Constructiv has recommendations passed on to it from two channels: the regions and the sections.

The region is a joint action and consultation body of Constructiv at provincial level. In carrying out its assignments it can also put sub-provincial sensitivities on the agenda. It is made up of local management and workers from the construction sector and is supported by the competent regional manager.

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The duties of the regions comprise:

- collaboration with daytime education with a full syllabus;
- collaboration in the context of organising and dealing with young people's apprenticeships.
- collaboration in the context of training schedule implementation;
- collaboration to develop sectoral initiatives for the benefit of the "construction risk groups";
- compiling all relevant information on the provincial sectoral labour market and temporary construction labour, as well as regularly drawing up a demand list for construction competencies that could not be met from the labour market. The geographical competence of the region extends the territory of the province.

The region is run by day-to-day management, that is made up jointly of regional representatives of the Constructiv member organisations, including employer and employee organisations. The day-to-day management is assisted in an advisory capacity by one expert in safety and well-being issues and the regional manager of Constructiv or a training advisor appointed by him. The regional manager's role comprises the overall coordination of the region's activities. The regional manager or a training advisor appointed by him acts as secretary of the region.

☐ Vormelek

Vormelek is the training centre for all employers and employees in the 149.01 joint committee. This is the joint committee for electricians. Accordingly, this sector also takes on employees who operate in renewable energy and energy efficiency. Solar panel installers are but one example that comes to mind. The organisation was set up in 1991 in response to on-going training needs. In other words training is crucial in order to remain successful. This understanding led management and workers to set up an occupational training centre.

Like Constructiv, Vormelek is funded through a collective labour agreement. In the collective labour agreement employers and unions have laid down that 0.75% of each worker's gross salary will be paid in to support training for workers and to activate risk groups.

In order to keep knowledge levels in our sector up to scratch, Vormelek is working on various fronts simultaneously. First and foremost, there are the efforts in terms of training and competency management. Furthermore, Vormelek is also engaged in

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sectoral research and analysis. In addition, Vormelek is conducting all manner of campaigns to promote the intake of employees.

☐ OCH

The Training Centre for Wood [OCH in Dutch] is the training centre for the Soft Furnishings and Woodworking sector. This sectoral training centre was set up in 1988. In order to develop and support training and competency policy in the sector, OCH is operating in various fields and for various target groups:

- Training courses and competency policy for companies and employees. Guidance and training recommendations, monitoring of the training market, etc.
 - Monitoring of the labour market in line with problem area vacancies. Induction of new employees (jobseekers' training)
 - Assistance for outflow through sectoral outplacement, etc.
 - Link between education and the labour market, including through suitable wood education. Refresher courses and company visits for teaching staff, follow up on "Learning and Working", promoting work placements, etc.
 - Sector promotion and image
- ◆ Skill needs: structures to monitor developments in technology, competencies and training

☐ BBRI (Belgian Building Research Institute) Technical Committees

The BBRI has sixteen Technical Committees. Eleven of these are devoted to a specific construction discipline and are chaired by a contractor, while an engineer-coordinator appointed by the BBRI is charged with the proper conduct of their meetings. Furthermore delegates from the construction trades concerned and various other experts also sit on these occupation-related Committees. Four other Technical Committees, which are also chaired by a contractor, are tasked with directing the more horizontal themes cutting across the occupations (including hygrothermy, acoustics and business management). The latest Technical Committee is made up of delegates from the world of architecture and is responsible for consultations with designers.

The various Technical Committees that conduct research campaigns – this involves the eleven occupation-related Committees and the horizontal Committees in particular – are required systematically to prepare a three-part work programme (information transfer, information gathering and other action). As far as information transfer is

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concerned, the Technical Committees develop Technical Information and reports. In order to be able to disseminate information, one needs first and foremost to gather the requisite information. This involves research activities that usually run for several years and that can be innovative as well as pre-normative in nature. In addition to this, participation in these activities on standardisation and technical approval constitutes an important source of information.

Their task is to direct research into their specific field from a practical point of view (bottom-up approach) and to ensure that the research results are transferred to the shop floor in a usable manner.

▣ Constructiv

The sections ensure that the training content is optimally matched to the specificities of the various distinct occupations. They issue advice to the Constructiv Board of Governors. Each section is led by a core group made up of experts from Constructiv member organisations and employees in the training department.

▣ Incentives, changes and innovations concerning sustainable building

◆ Incentives

The development of a socially supported policy framework that premises nZEB-buildings (nearly zero energy building) as a realisable exigency is an important social challenge. It will require large investments in the fields of energy efficiency and renewable energy by prime contractors as well as companies/the industry and the public authorities.

It is important that those investments are executed in a correct way because of the following aspects:

- avoiding health troubles;
- good general performance;
- maximal longevity;
- maximum energy efficiency;
- avoiding risks for the installer;
- avoiding risks for the user of the building;
- avoiding building physical problems (cracks, moisture problems, ...);
- realising a market embedding and a stable growth of the innovating techniques;
- agreement between real (measured) pay-back time and theoretical pay-back time.

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Hence, guaranteeing a high-quality execution is a necessary condition in the framework of the developments in the fields of energy efficiency and renewable energy that the construction industry will experience by the year 2020.

◆ Need for qualification and skills

The renewal of the existing professional competence profiles started in 2011 in collaboration with the social partners, BBRI and experts in the industry (technical experts and safety experts). This process was finished at the beginning of 2014.

The professional competence profiles contain an overview of all activities and the associated competences for each profession. In order to respond to the challenges brought on by the EU 2020 goals, they all have a solid 'green' foundation. Profiles will be available and will form the starting point for the development of adapted training programmes and didactic tools as well as for an appropriate screening of potential construction workers.

The roofer's profile has been completed in 2011 (22). Before, the main question was: "How and with which materials can we tile a roof and make sure it is watertight?".

Nowadays, the questions that have to be posed and answered are more complex:

- What are the exigencies in the field of energy efficiency?
- What is needed in terms of insulation?
- With which adjusted materials does the work have to be executed?
- How can we make the roof airtight?
- Does the installation of solar panels have to be foreseen?

These new questions bring along new exigencies in terms of the roofer's professional competence. By mapping the new exigencies and new techniques (insulating in an airtight way, posing thermal insulation, etc.), the basic and advanced vocational training for roofers can be adjusted to these new needs.

▣ Drivers and barriers for the development of sustainable construction

The challenges in the field of sustainable building, that have been reported in this study as well, are endorsed by the social partners. Green economy and sustainable building are necessary answers to the ecological and societal challenges. Not only does the environment benefit from the achievement of ecological goals, such as raising the use of renewable energy and improving the energy efficiency of buildings, a reduced

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dependency on gas and oil can provide economic added value, too. Improving the energy efficiency of buildings and raising the use of renewable energy does have practical consequences for the construction sector. Improving the energy efficiency of buildings and raising the use of renewable energy does have practical consequences for the construction sector. The social partners point out that a well thought-out answer has to be provided regarding these consequences. The answers have to be situated in different fields. The following passage contains an identification of these fields, the subsequent passage provides more details on the elements which the social partners will have to discuss.

- ◆ What is sustainable building? Which materials and techniques are used?
- ◆ Performance standards in the field of sustainable building, as opposed to the obligation to use best efforts
- ◆ Sensitisation of the executor and the contractor
- ◆ Societal levers for the promotion of green economy and sustainable building
- ◆ Impact on the employment
- ◆ The efforts go beyond Joint Committee no. 124
- ◆ What is sustainable building?

Sustainable building can be considered as a means to reach a goal. By raising the use of renewable energy, improving the energy efficiency of buildings and using renewable materials, ecological and economic gains can be achieved. There are different possible ways of proceeding in order to achieve these goals. For example, insulation is important for the energy performance of a building, but can be done using various materials. Several questions have to be taken into account:

- Concerning safety and well-being: can we use those materials, with regard to the final occupant or user of the building as well as with regard to the person who handles them, i.e. the construction worker? For instance, regarding insulating materials, we can ask the question of knowing what are the long term effects. It is not the social partners' task to pronounce themselves on what is sustainable building, but it is their job to take into account the possible consequences the use of new techniques and materials can have in the field of safety and well-being.
- Concerning the competencies: the use of new materials and new techniques will lead to additional requirements concerning the competencies required from construction workers. The social partners think that a good follow-up of these renewed competency requirements

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is of the essence. That is why the follow-up of the competencies required and the permanent update of the professional competence profiles are important tasks that matter for both construction workers and entrepreneurs.

- Concerning the efficiency and purposiveness of the materials and the techniques: which materials are best to make the desired energy profit? How can a construction entrepreneur and his workers indeed meet the required energy standards?

In order to find an answer to the question of knowing: "Technically speaking, what is the best way to build "in a sustainable way", as well as in a safe and competent way?", the social partners can appeal to the different sectoral knowledge centres, such as BBRI and "Opzoekingscentrum in de Wegenbouw", but also Constructiv's Technical Knowledge Centre.

- ◆ Performance standards in the field of sustainable building, as opposed to obligations to use best efforts

Prime contractors will be confronted with a different approach. For example, in the past, x centimetres of insulation had to be installed, but in the future, the energy performance of a building will have to reach a certain level. Therefore, the competency level of construction workers will have to meet other exigencies. In order to keep on guaranteeing the workers' employability and to safeguard their position on the job market, it will not only be a challenge to keep up with the different technological evolutions, but also to really translate them into an adjusted training policy within a sectoral framework. This policy can be supported by the sectoral partners using the sectoral levers needed. A high-quality training offer has to exist and has to be adjusted to the needs of the companies and the workers they occupy. Apart from that, the necessary levers (financial as well as with respect to content) have to be offered to make sure that an answer can be given to every competency need that is detected.

- ◆ Sensitisation of the executor and the contractor

Sustainable building often entails extra costs for the commissioner. This can impede the commissioner from making the efforts needed. Apart from that, the executor/prime contractor often has contacts with the commissioner and can give him all information needed concerning the surplus value of these investments and concerning the extra surplus value of a high-quality execution. Ideally, there is promotion in order to raise awareness of the advantages of a higher-quality execution and higher-quality materials.

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In the framework of this promotion, the final user has to be informed on how he can recognise a qualified professional and good quality and what he can realistically expect. The different social partners already undertake initiatives in that context. From the trade union side, there are initiatives in the field of training and awareness-raising among trade union representatives (RISE, BRISE, ...). For example, workers are sensitised to broach the subject of sustainable building in their company. Apart from that, several initiatives are also undertaken by the employers' organisations (concerning awareness-raising; quality labels, training, documentation, ...). These initiatives can be built upon.

◆ Societal levers for the promotion of green economy and sustainable building

The (federal and regional) governments put important levers at the public's disposal. The social partners raise a question concerning the continuity of the measures. Levers (financial contributions, tax deduction, etc.) are often modified between times, for example because of a new policy. The social partners throw in that this often has negative effects and ask that the continuity stays guaranteed. Renovation works, for example, have to be planned in the long term.

◆ Public governments as owner and prime contractor

Public governments are a big contractor in the field of buildings and infrastructure. In that framework, they have an exemplary function, as well with regards to the materials and techniques that are used as with regards to the granting of contracts to executors.

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4. Joint consultation and sustainable building

4.1 Industrial relations system in the construction sector

Belgium has an elaborate system of social dialogue on all levels (interprofessional level, sectoral level and company level) and concerning the different socio-economic fields (economy, social policy, safety and health). This institutional system of negotiations that are carried out on different levels between social partners results in the conclusion of collective labour agreements. The joint committees were created in order to negotiate on collective labour agreements in every activity sector. The results concern the terms of employment as well as the wages and the maintenance of social peace.

Every two years, employers and workers try to conclude an interprofessional agreement. In this agreement, engagements are determined concerning the "social progression" (wages, employment, training, ...) they want to realise for both working and non-working population. The interprofessional agreement applies to the whole of the Belgian private sector and offers a framework for negotiations in the sectors that have concluded agreements on the wage conditions and terms of employment.

In their capacity as social partners, employers and unions are also represented in numerous other advisory and consultation bodies, among others in the Social Security's management bodies. Since the state reforms, regional consultation structures have also been created. The most important ones are the economic and social councils, in which the social partners formulate recommendations towards the regional governments concerning bills and themes with a social or economic impact. Apart from that, the social partners are also represented in the advisory councils specialised in other regionalised authorities, such as environment policy, education, science policy and environmental planning. Finally, the social partners are members of the management bodies of different regional public institutions, such as employment offices and services for professional training.

In companies with over 50 workers, social elections are organised every four years. Through these elections, workers can appoint their delegates.

Social consultation in the construction sector

The employer's and employee's organisations are represented in the Joint Industrial Committee for the Construction Industry. In this joint committee, engagements are determined concerning the consultation in companies and negotiations are carried out

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concerning the wage conditions and terms of employment of 150.000 workers in the construction sector. The negotiations take place every two years.

Constructiv was created within this joint committee. Constructiv is a social protection fund for construction workers. Its core tasks include the granting of additional social benefits, prevention, safety and professional training. Constructiv is financed through social security contributions.

On company scale, the social consultation is carried out by the employer and the union representatives. Staff representatives are appointed by the representative trade unions in all building companies occupying at least 30 workers.

4.2 Role of the joint consultation in support of sustainable economy and sustainable buildings

There are several partnerships in the field of green competencies in which the different social partners are involved directly or indirectly (e.g. via Constructiv, a joint working organisation).

- ◆ In Wallonia

- ▣ Greenwal

Wallonia created its own centre of excellence, Greenwal, that focuses solely on sustainable building. Its objective is:

- ◆ to boost the sectors of renovation and construction of new buildings
- ◆ to build bridges between training, research and innovation
- ◆ Greenwal's members are:

- ▣ The employer's organisations
 - ▣ The employee's organisations
 - ▣ Other parties concerned

Greenwal offers the following services, activities and projects in the field of sustainable building:

- ◆ Trainings
- ◆ Dissemination of information and advice
- ◆ Demonstration of innovation
- ◆ Monitoring and prospecting

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- ◇ Support during the start-up of activities

The target audience for this services consists of:

- ◇ Consulting firms (public and private), architects, communal architects, energy advisors, specialists in urban development, property developers, housing departments, etc. (for the design of the project)
- ◇ Employees (working or non-working), contractors in the construction sector (very small businesses as well as SMBs), site managers and workers active in all activity fields (structural, special techniques, roofers, etc.), municipal and provincial office workers, mandatories, the trainees in the IFAPME network, etc. (for the realisation of the projects)
- ◇ The instructors (who are active and are part of one of the aforementioned categories)
- ◇ The general audience: future builders, renovators, schools, etc. (by means of sensitisation actions, open days, access to documentation and advice)
- ◇ Young people who are following a training

- ◇ ConstruForm

ConstruForm's two competency centres (in Hainaut and Liège) encompass nine locations along the Mons-Charleroi-Namur-Liège axis (“dorsale wallonne”): ConstruForm Hainaut comprises four of these locations (Châtelineau, Braine-le-Comte, Gembloux and Mons), ConstruForm Liège six (Huy, Gembloux, Grâce-Hollogne, Liège, Villers-le-Bouillet and Flémalle). The Gembloux site is shared by the two centres. The target audiences: company managers, workers and employees in the construction sector, jobseekers, teachers and students in final-year classes, apprentices. The partnership is based on centralising materials and resources of the two public training institutes Forem and IFAPME.

- ◇ In Brussels

- The Vocational Reference Centre for Construction

The Vocational Reference Centre for Construction CDR-BRC was created in the framework of the Alliance Employment-Environment concluded between several partners, being the government of the Brussels Capital Region, Actiris, Bruxelles Formation, VDAB and the construction sector's social partners.

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CDR-BRC's activities focus on young people in technical and vocational education, jobseekers, workers, teachers and instructors and can be divided into three main categories:

- ◇ Doing something about the shortage of trained workers and increasing the intake of students from construction education in the construction sector
- ◇ Stimulating the communication between education, the Brussels institutions (including Actiris, VDAB, Bruxelles Formation and EFPME) and the construction sector
- ◇ Creating a framework in which a sustainable collaboration in the field of the integration of new technologies, the quality of work placements and workplace training, etc. can be further developed.

- ◇ In Flanders

- ▣ Task force Sustainable Building

The TASK FORCE Construction consists of Constructiv (that unites the social partners), the Flemish federation of SMEs of the construction industry Bouwunie, the Building Confederation, the centre for sustainable construction Centrum Duurzaam Bouwen, Syntra and VDAB.

The TASK FORCE Construction co-ordinates the training environment and supports the exchange of information between the different parties concerned. The institutes that provide more conceptual, theoretical trainings, like Syntra and the Building Confederation, and the practical trainings given by VDAB complement each other.

In the TASK FORCE Construction, the different training partners and parties concerned by the construction sector mutually consult. At the moment, the priorities are:

- insulation and airtightness, roof
- construction knots
- timber frame construction

An important challenge for the future will be to give the collaboration between the instructors and the training operators a more operational character. Some important themes in the changing competencies are environment, quality and well-being. Those themes have been included transversally in the professional competence profiles for the construction sector. The transversal competencies mainly concern:

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- awareness of airtightness and ventilation
- sealing and covering with tape
- heat losses
- moisture insulation

In the meantime, a lot of trainings have been developed and implemented and, in consultation with the construction sector, the task force sustainable building has drawn up a new priority listing that fits in with the Flemish nZEB action plan.

▣ Drivers and barriers for the social dialogue

◆ Impact on the employment

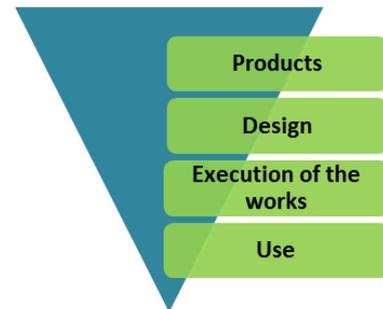
In the text above we already mentioned that the evolutions in the field of sustainable building have an effect on the competencies construction workers have to have. The professional training of young people and the advanced vocational trainings for construction workers have to be adjusted to these evolutions (in a technical and non-technical field). On the one hand, we have to avoid an increase in the shortage of qualified workers. On the other, the employability of the construction workers who are already active has to remain guaranteed.

◆ The efforts go beyond Joint Committee no. 124

By definition, the Joint Committee no. 124 (competent for construction workers) is only competent for blue-collar workers in the construction sector. However, the evolutions in the field of sustainable building are not limited to this target group. White-collar workers (designers, site managers, etc.) who are active in the construction sector are faced with these evolutions, too. Furthermore, other activity fields and target audiences are also involved in the evolutions in the field of sustainable building: architects, electricians, the wood sector, manufacturers of building materials, etc. One of the consequences of sustainable building is that communication between the different parties concerned will become more important (cf building knots), as well on the construction site as during the preparatory activities (design, materials and techniques used, etc.). The social partners suggest that a platform can be created in which the different parties concerned (wood sector, electricity sector, technical knowledge centres, manufacturers, merchants, social partners, architects, training institutions, etc.) can meet in order to specifically discuss these subjects. One of its goals could be to promote the transition of technical evolutions to the training field.

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5. Guidelines for social dialogue in green building: tools & areas of action
5.1 Tools to strengthen the social dialogue

The platforms and tools to organize the social dialogue are present, This is not the main challenge in Belgium. The challenge is the improvement of the competence level of the Belgian construction workers with regards to sustainable building. Specific measures to improve this competence level can be grouped in five clusters.



Specific measures, often cross-technology, can be determined. These measures aim to increase overall quality in the process (see figure) to deliver renovations offering a high energy performance as well as new, nearly zero-energy buildings.

Given the target group, namely the on-site construction workers and system installers in the building sector, the determined measures focus mainly on the phase ‘execution of the works’.

However, the previous phases (products and design), have a significant impact on the final quality, and cannot be neglected. To ensure maximum longevity and efficiency of the installation or the building, the use phase with correct handling, monitoring and maintenance is essential as well.

There are several actors with direct or indirect impact on the quality delivered by these on-site workers: architects, managers, manufacturers, retail & wholesale traders, consumers, ...

Various barriers will only be eliminated if all relevant actors are involved and included as target groups. Moreover, advanced or new cooperation mechanisms between the main actors should be further developed.

AWARENESS RAISING IS CRUCIAL

Awareness raising is considered as a *conditio sine qua non* to make any progress. The market is demand-driven, and to avoid a business as usual scenario, proprietors need to be aware why and how to demand quality. Dissemination and training for the on-site workers and their supervisors have to be adapted on their level of competences (experience, knowledge, capacities...).

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Measures to strengthen social dialogue can be derived from five strategic clusters:

1. *Instruments for quality control.*
2. *Dissemination and awareness.*
3. *Reorientation vocational training.*
4. *Contribution of the manufacturers.*
5. *Redefining professional competences.*

5.2 Area of action

5.2.1 Policies and legal framework

▣ IMPORTANCE OF QUALIFICATION SCHEMES (*Instruments for quality control*)

Stakeholders have indicated the importance on qualification schemes as instruments for quality assurance. On the condition that investment in quality assurance is rewarded, it is recognised that mandatory control mechanisms and/or certification¹ schemes have a significant added value as motivator for raising knowledge, keeping this up to date and applying it during execution of the works. These qualification schemes need to be developed in accordance with or by the relevant actors. By doing this, the installation and/or the quality of the final product is made actionable. This can be done by introducing a labelling of the executor (and/or the employer) or by doing a control on the executed activities and the provided services, or even by the drawing up of an internal training scheme in an organization.

5.2.2 Working conditions and new skills

▣ Adaptation of the existing competence profiles (*Redefining professional competences*)

Competence profiles are available for different professions in the construction industry. Ideally, they are adjusted as much as possible to the technical information sheets and the different technical specifications. These two documents are technical and have to be translated correctly into competences for each profession by means of the professional competence profiles. The competence profiles are the reference documents in which the content of the education and vocational training courses are defined.

¹ Certification refers to the confirmation of certain characteristics of an object, person, or organization. This does not necessarily imply third-party certification.

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The competence profiles have to be expanded with the necessary soft skills or attitudes concerning collaboration. The professionals have to be open to the different steps in the construction process and take into account other people's activities. For this purpose, the attention will have to be focused not only on the technical aspects, but also on, among other things, the communicative skills (the professionals have to learn each other's language), conflict management, professional honour, etc.

Interaction between professions on a worksite could be identified (how, stages of work,...). A logical and ideal work method could be determined.

Ultimately, we have to make sure the professional competence profiles are permanently updated and implemented in training programmes, so that they are adjusted as fast as possible to the reality of the work field. For instance, future updates should also take into account the evolutions in the domain of digitalization.

▣ New function: energy coordinator (*Redefining professional competences*)

Creation of a new profession and/or function: a person who can propose the best available techniques (energy - design) on the basis of the specifics and who can coordinate the execution of those techniques.

By means of intermediary controls, he can immediately provide the executor with feedback, so that this person can intervene on time if that is necessary. Lastly, he coordinates the post-project assistance.

The first step will be to verify if this function requires a new profession or whether it concerns architects, site managers, team leaders, EPB controllers and safety coordinators, who will have to acquire extra competencies.

▣ Reorientation of trainings: Integration of the element 'Renewable Energy' in the existing training courses (Reorientation vocational training).

The content of this training has to be in line with the expectations in the work field. In other words, the training has to be adjusted as much as possible to the reality of the (best) practice. Only then can such a training produce good workers and be a promotion vehicle for the profession.

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- ◆ General training material could be developed.
- ◆ Train the trainer sessions: the trainers have to be correctly trained so that they can teach and transfer the content of the training and the training material in a high-quality way.
- ◆ Well-equipped rooms with a correct pedagogic disposition are needed.

▣ Training modules for different levels (Reorientation vocational training).

It is necessary to develop vocational trainings for different professionals. The executors' training needs not only vary in function of the different backgrounds they have, but also in function of their 'level', as well in accordance with their function on the construction site (executor, team leader, etc.) as in accordance with their experience level. Additional short modules for different target audiences have to be developed in addition to the existing offer. In order to enable this development, there first has to be a consensus on the content of the activities that will have to be executed.

- ◆ development of mixed trainings. Mixed trainings are trainings that are not meant for the traditional (homogeneous) target audiences and that are not theoretic. They are practice-related trainings that are given in the form of workshops for people from different disciplines.
- ◆ Training courses have to be practice-oriented. The best place to give them is in a training centre in which the different techniques can be demonstrated, e.g. with the support of installations that the industry puts at disposal.

▣ Interdisciplinary training courses (Reorientation vocational training).

There is a need for interdisciplinary training courses in which the building professionals acquire knowledge of the other professions. The goal of this is to revalue the knowledge of and the respect for the work of other people.

▣ Train the trainer courses (Reorientation vocational training).

It is important to find the right trainers and to make sure they are trained well themselves (train the trainer). This training not only has to be technically correct, but the trainers also have to be informed on the importance of the different technologies and the importance of a high-quality execution. Trainers need to have sufficient pedagogical skills and need to adapt their course to the public (difference in level of participant or goal of the participant). An inventory of the existing training courses and training centres (as well for general as for sectorial training courses, e.g. for

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manufacturers) has to be established. Further on, the need for TTT training courses has to be estimated.

5.2.3 Technology, Knowledge, Innovation of the productive processes

▣ Building your Learning (*Dissemination and awareness*).

A centrally managed portal site and/or accessible data base is drawn up, so that basic data and details of good executions, simulation tools, etc. can be consulted. These data have to be offered in a global and centralised way and they have to be in line with ongoing activities or existing initiatives. Fragmentation of the channels is not an option. A digital and interactive construction library is now available. The initiative for this library was taken by Constructiv (joint organisation) in order to promote an innovative, pioneering, interactive and highly attractive education towards the construction trades.

At the moment, more than 2,000 educational resources can be downloaded that reflect the realities of the construction industry and teaching methods adapted to young audiences:

- ▶ targeted excerpts from Constructiv's trades manuals;
- ▶ tools and materials that have been proposed by the teachers and other instructors who wish to share their educational resources;
- ▶ PowerPoint presentations made by Constructiv or proposed by a teacher or an instructor;
- ▶ video materials and links to interesting sites from manufacturers;
- ▶ "ConstruBooks" (e-books): a new form, but above all a new concept for learning trades that provides a personalised and interactive navigation through the content. These e-books are interactive manuals that open up new learning paths adapted to young audiences and to the new technologies, so they are very attractive as materials that can help develop things like:
 - Reversed education forms in which the students go through the indicated materials at home so that more time can be spent on the practical implementation at school;
 - A teaching aid for the tutor who will accompany a young person during his learning experience on the construction site or the teacher in his workshop;
 - A personalisation of the course material for the teacher who will be able to create a trajectory that is adjusted to his students' learning speed: based on the pedagogical sessions and the students' level of learning.

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The teachers also have to possibility to propose teaching aids that can be added to this digital library. When their tools are uploaded, they are validated by the Centre of Technical Competencies before being published in the digital library.

▣ Mobile technologies on the construction site (*Dissemination and awareness*)

Smartphones and tablets are increasingly used on construction sites. They have truly become mobile offices on the construction site, with various levels of use on all levels and in all functions of companies.

Digital supports can be used in order to register one's personal data, look at the weather forecast, send information by mail, plan the appointments with the other parties and the suppliers, browse through ConstruBooks, ask for technical advice, generate a photographic survey and before long also a metric survey, regulate a heating or ventilation system, etc. Their use as an information and communication tool and as a tool for the regulation of the construction site has become an integral part of the technical learning path.

In the long run, we can imagine all these applications being connected to the digital model that is shared between the author of the project and the company in order to set up a 3D construction site workbook that is associated with the complete lifespan of a building.

Construction workers will have to acquire new competencies in order to control the use of these new technologies and to be able to adapt to the actual impact on the content of their job.

▣ Harmonised communication from the manufacturers

The manufacturers have to announce their products' performances in the best, reliable and most neutral possible way through their technical sheets, attestations of technical approval/eTAG's, CE attestations, BENOR attestations, etc. Therefore, they have to dispose of harmonised standards or test standards for the classification of components.

In-house trainings that have both a neutral and a commercial component can be foreseen. In consultation with the knowledge centres and sectorial funds, the manufacturers determine the content of the neutral part, so that this can be maximally harmonised. A control on the quality and the content of these training courses and their permanent update seem to be absolutely necessary.

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▣ "Habiter sa classe"

◆ Goal

This project aims to design educational resources for the "education through technology" course that is given in the lower secondary education in the Federation Wallonia-Brussels (Belgium). The resources will provide the teachers concerned with a method and educational tools in line with the specific objectives of the "education through technology" course. In reference to these goals, the students will have to develop technological problem-solving skills by using the technical aids and the equipment they can find in the classroom. By doing so, they will discover the construction techniques and trades.

◆ Educational method

The project that will be proposed to the students is called "Habiter sa classe". It aims to promote well-being in the classroom that they use the most, ensuring the effective use of energy and optimum protection of the environment. The suggested situation/problem will be: **what are the sources of discomfort and how can they be remedied?**

◆ Participative audit

Every research aimed at improving a situation starts by drawing up a "state of affairs" of the situation. The first step towards resolving the problems will be that the students carry out a **participative audit** of the classroom that they use.

◆ Areas of improvement

Avenues will be proposed to help fuel the research for improvement. They will have to be "accessible" for the students in the lower secondary education. Below, you can find some examples of areas of improvement that will be suggested.

Thermal comfort:

- Secondary glazing by means of a (heat-shrinkable) stretched transparent film;
- Wall hangings that can be used to create an insulating blade of air;
- Reflective foil on the insulation behind the radiators;
- Insulation from within of the cool walls;
- Sealing of the cold air intakes (cracks, faulty chassis, ...);
- Reflective internal blinds to prevent overheating ...

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Acoustic comfort:

- An absorbent to limit the resonances in the room (wall hangings, carpets, wool panels on the walls, ...);
- Sealing of acoustic leaks;
- Protective pads under chairs to limit the noises of moving chairs;
- Doubling of thin walls ...

Visual comfort:

- Light-coloured paint on the walls to increase the amount of light reflected;
- Cleaning or removal of the opal glass on the lights;
- Added reflectors on the lights;
- Transparent stores to reduce glare ...

Quality of the air:

- Indication of the CO₂ and/or humidity content and aeration of the classroom when it exceeds the maximum allowable value;
- Arrangement to maintain a permanent basic ventilation;
- Intensive ventilation during unoccupied periods ...

Quality of life:

- Paint and/or fresco on the walls;
- Refurbishment of the classroom furniture;
- Friendly interior design of the workspace;
- Removable panels to create separate work stations ...

◆ Introduction to construction

To help fuel their research for improvement, the students will have technical datasheets on the amenities that contribute to the comfort of a room. Every component of the comfort will be discussed. These datasheets will also explain the role of the construction professionals during the design and construction of these amenities.

◆ Educational resources

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Three types of resources will be proposed:

- documents, an educational guide and technical datasheets;
- equipment and measuring devices associated with observation checklists;
- a coach who guides the participative audit.

◆ Partnership

The educational resources will be designed by the university team, which brings together the Architecture and Climate and "Scienceinfuse" units of UCL and CIFFUL and is coordinated by CIFFUL. Constructiv will promote the resources to the schools.

5.2.4 Cultural dimension

- Change in mindset (Dissemination and awareness).

A change in attitude of professionals is required. The workers will also have to be open to what is happening in other professions. An important question that arises is: what belongs to whom on a construction site? That intermingles a lot these days, hence the required change in attitude. That same change in attitude will also be required of trainers. They will also have to take a look at what their colleagues in other professions do.

- More knowledge of EE and RES technologies has to reach different target groups (Dissemination and awareness).

One could imagine a communication campaign that focuses on the general public and another campaign that focuses on a professional public. The campaign for the general public can make use of TV, radio, the general press and schools, while the campaign for the designers can make use of specialised channels/publications that can reach all concerned parties (architects, engineers, contractors, workers). In addition, there could be promotion in order to raise the awareness concerning the advantages of a higher-quality execution and higher-quality materials. In the framework of this promotion, the final user has to be informed on how he can recognise a qualified professional and good quality and what he can realistically expect. Such a campaign is meant to enhance the call for high-quality installations.

The development of a basic package that can be offered to secondary schools, colleges, universities can also be considered.

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5.3 Directions for the social dialogue at a European Level

Based on the previous text, one might suggest two key elements that could be taken up on a European level:

- ▣ Establishment of paritarian funds : Social dialogue resulted in the establishment of paritarian funds in Belgium. The members of the board of administrators of these funds are representatives of the employee and employer organisations. The mission of these paritarian funds is drawn up in collective labour agreements. The Belgian construction industry has one paritarian fund: Constructiv. It is active in the following domains:
 - ◆ social advantages
 - ◆ well-being
 - ◆ vocational training

These funds play an important role in bringing the social partners together and as such are sometimes the “engine” that promotes industrial relations. These funds, as a result of the mission they are bestowed with, can play an active role in society and act as a lever to help reach the objectives that are defined by social partners by means of:

- ◆ financial incentives
 - ◆ developing networks
 - ◆ facilitating
 - ◆ mediating
 - ◆ lobbying
 - ◆ communication activities
-
- ▣ One might suggest the development of professional profiles could also be organized on a European level (e.g. ESCO). However this should be implemented while at the same time considering aspects like: social dumping, access to professions, ... What might seem as beneficial in one context might not be deemed as beneficial in a different setting.

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Country Report and Guidelines on social dialogue

Germany

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Foreword

Environmentalism has a long history in Germany. As early as the late nineteenth century Germany was home to a growing nature movement that sought to limit the attending ills of industrialisation for humans and the environment. In the wake of the 1973 oil crisis, wide awareness for the limited natural resources and the need to conserve energy developed in West Germany. For example, this increased environmental awareness was manifested in the political success of the Green Party in 1980, which from 1983 was represented in the German Bundestag. A few years later, the nuclear disaster at Chernobyl led to the German Federal Government's establishment of the Ministry of Environment, Nature Conservation, and Nuclear Safety (BMU).

The trade union **IG Bauen Agrar Umwelt** (IG BAU) early began to take an interest in the environmental aspects relevant to its fields of activity, including ecological and sustainable building. When Germany's then-ruling red/green coalition initiated the Bündnis für Arbeit (Alliance for Jobs) in 1998, the trade unions and BMU joined forces to establish the **Bündnis für Arbeit und Umwelt** (Alliance for Jobs and Environment), the first organisation ever to bring together employers, unions, and environmental NGOs at the same table. The key actors had realised that the combination of work and environment represented a win-win situation. The social dialogue, which until then had been conducted between employers and unions in a classical fashion, was now bolstered by the integration of actors from civil society (environmental NGOs) that brought with it a new component that ever since is a central part of the political decision-making process. The unions, most importantly the IG BAU, the only German trade union to enter into dialogue with environmental associations, play a significant role in the process.

To date, one of the trade union IG BAU's primary concerns is the strengthening of green building, thus combining labour, health, and environmental protection issues. Together with the German Federal Environmental Foundation (DMU) and the German Confederation of Skilled Crafts (ZDH), IG BAU initiated the project "Sanieren – Profitieren" (Renovate and Profit), which creates a network for craftspeople and offers free energy checks for the owners of one- and two-family houses aimed at providing homeowners with good advice and professional workmanship for refurbishments. The trade union IG BAU is also dedicated to promoting sustainable education in the building trades. Knowledge of alternative building materials and a resource-friendly recycling economy

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needs to be reinforced. For this reason, IG BAU and the PECO Institute for Sustainable Regional Development have for years conducted seminars focusing on ecological construction in vocational schools supported by the Foundation of the Bavarian Building Trades (Stiftung Bayerisches Baugewerbe).

Holger Bartels

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Picture 1 - Training on Green Building, Vocational School Munich 2015



(photo credit: PECO)

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1. THE GREEN BUILDING SECTOR: MAIN CHARACTERISATION

Given the sector's extraordinary high demand for energy and resources, the knowledge of the finite nature of the world's resources means that the building sector must play a leading role in ensuring natural resources are available to future generations. The energy-efficient construction and refurbishment of buildings is of key importance. Heating, hot water usage, and lighting in public buildings are the source of nearly a third of all CO₂ emissions in Germany.

The German Building Sector

In terms of economics, the German building sector has a key role to play. When it comes to production and employment, it is ahead of important industrial sectors such as the automotive industry, machine construction, or the chemical industry. In 2015, the building sector contributed 4.7% to the nation's gross value added. Its share of the gross domestic product was double as high with 9.8%. The building sector's share of German employment lay at 5.6%.¹

Compared to other European countries, the German building sector has proven itself stable. Whereas its dynamism decreased after the boom of 2010 and 2011, when compared with 2007 there has been an increase in building investments of €11 billion, almost all of which stems from housing construction.² As opposed to other large European countries of Spain, France, Italy, Poland, and Great Britain, **German housing construction** since 2007 represents **an exception**. German residential investments have even increased 1.4%, even though construction intensity (2.5 newly constructed residences per 1,000 inhabitants) remains under the European average.³ By means of the investment in **existing residential buildings** in particular, at 58.7% Germany has the highest share of residential building in Europe. In Germany, residential real estate remains a secure investment, and existing low interest rates encourage investment in the sector.

¹ www.bauindustrie.de/zahlen-fakten/bauwirtschaft-im-zahlenbild/bedeutung-der-bauwirtschaft, accessed on 9 June, 2016.

² Rein, Stefan und Christian Schmidt, "Europäische Bauwirtschaft im Vergleich - Ausnahmeposition des dt. Bausektors in Europa". BBSR-Analysen KOMPAKT 12/2014 (Bundesinstitut für Bau-, Stadt- und Raumforschung), p.3.

³ Ibid., p.8.

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Figure 1

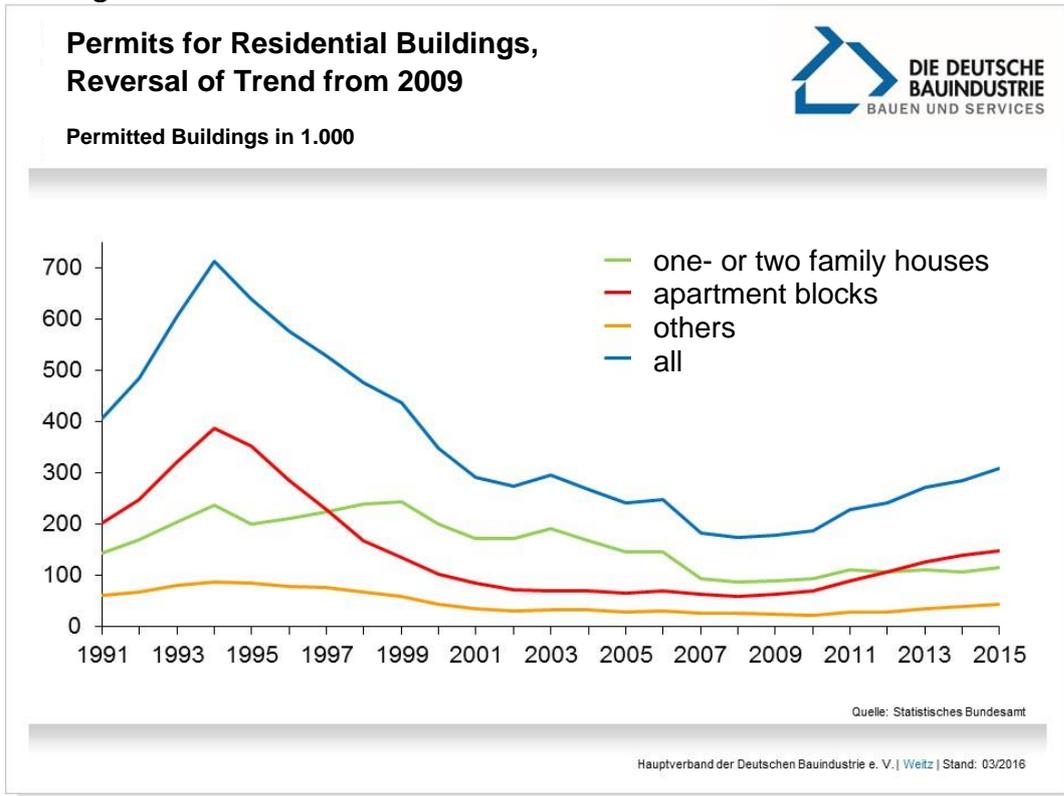
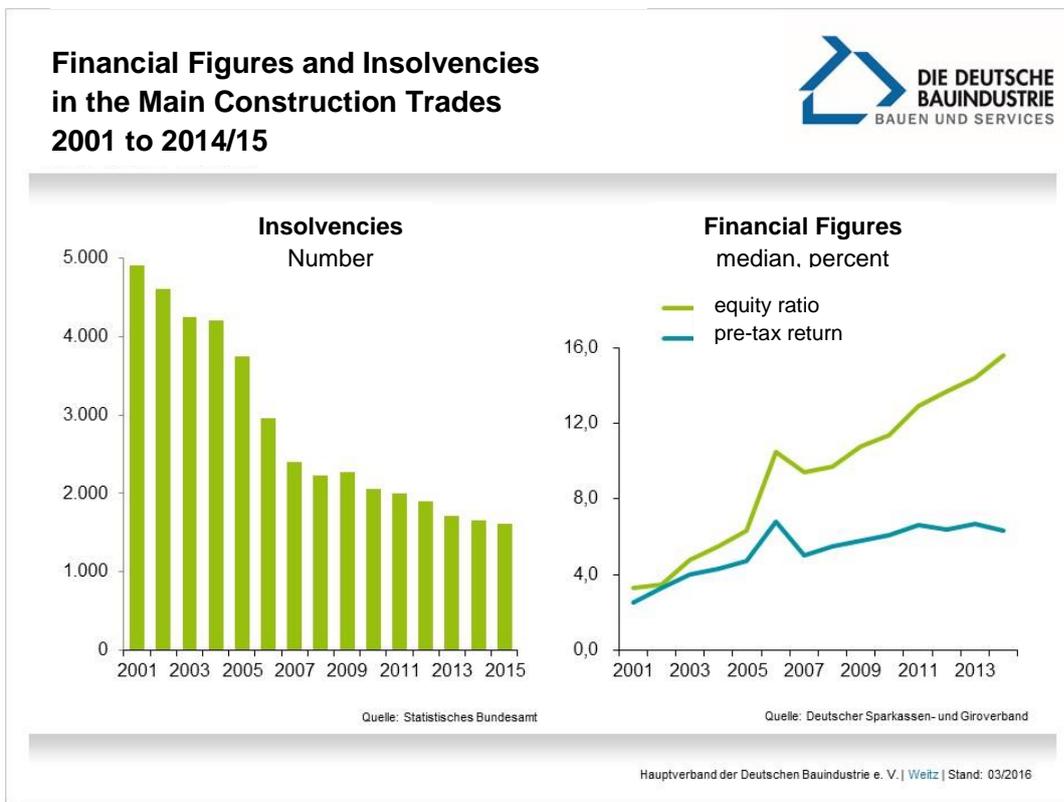


Figure 2



(diagrams modified by PECO for translation)

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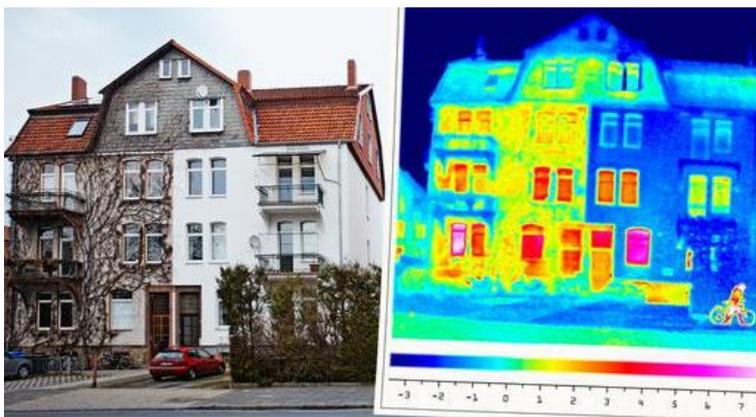
At mid-year 2016, the main building trades can draw a positive balance: compared to the same month in the previous year, in June the companies have shown a 21.6% increase in orders. At present, 90% of all companies expect a more favourable or at least an unchanged business situation.⁴ The basis for this outlook, in addition to low interest rates, is to be found in a continuing positive employment situation as well as immigration and migration within Germany (influx into cities and areas of high population density).

The Importance of Green Building in Germany

Thanks to modern building technology and professional refurbishments, up to 80% of Germany's energy consumption could be cut – a potential that must be tapped in the near future. Whereas specifications for new buildings will soon incorporate the lowest-possible energy standards, the existing building stock poses the main challenge. At present, only about 1% of old buildings in Germany is being refurbished to increase energy efficiency – and in many cases this is not even carried out under optimal standards. In order to achieve the climate goals, this renovation backlog must be removed.

Whoever plans, builds, or changes a building in Germany must adhere to the applicable version of the German Energy Saving Ordinance (EnEV). Ever since the first EnEV was enacted in 2002, the energy-efficiency demands on buildings have been raised step by step. Together with the increase in legal requirements, the certification of buildings has continued to gain in importance.

Picture 2



(photo credit: fotolia/Ingo Bartussek)

⁴ (28.08.2016) "Halbjahresbilanz im Bauhauptgewerbe: ausgesprochen positive", www.baulinks.de, accessed on 31 August, 2016.

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Certification of Sustainable Buildings by the German Sustainable Building Council (DGNB)

Since 2009, the German Sustainable Building Council has evaluated existing and new buildings based on up to forty criteria. These not only include ecological characteristics such as energy efficiency or sparing use of resources, but also social (such as accessibility) as well as economic aspects, including running costs over the building's entire lifecycle or its so-called marketability (for example, risk of vacancy).⁵ The four quality factors – ecological, economic, socio-cultural, and technical – are weighted equally in the evaluation. This makes the DGNB system the only one to assign the same value to a building's economic viability as it does to its environmental performance.⁶ Additionally, quality of process and location are integrated into the evaluation. As of March 2015, nearly 900 building projects have received a DGNB certificate or precertification.

In the German market for environmentally-friendly construction, the DGNB system shares in 69% of commercial buildings (BNP Paribas Real Estate, 2015). In the market for new buildings, the DGNB's share is 87%. In recent years, real estate funds have shown sharp rise in interest for certified buildings.

⁵ See "Grüne Bauwerke sind auch in Deutschland gefragt", *Die Welt*, 27 November, 2014, www.welt.de/134720590, accessed on 8 August, 2016.

⁶ www.troldtekt.de/Wir-ueber-uns/News/Themen/Nachhaltiges-bauen/Ein-kurzer-Ueberblick, accessed on 8 August, 2016.

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2. DOMESTIC POLICY FRAMEWORK FOR GREEN BUILDING

2.1. Overview of Policy and Legal Frameworks

Green building must be understood as a subcategory of sustainable building. Sustainable building is defined as forms of construction that do not threaten the interests of future generations. In April 2002, the German Federal Government pledged to adhere to a sustainability strategy, which, in addition to social and economic goals, also included goals aimed at protecting humans' natural means of livelihood. With its draft from 30 May, 2016, the German Federal Government recently offered a new version⁷ of the sustainability strategy up for discussion.

The themes of energy consumption and heat production, resource efficiency, and the handling of hazardous substances are of great significance to the building sector. A number of laws, regulations, and initiatives of particular importance to the building sector that stem from this package of measures will be outlined below.

Energy Policy

An important component in the German sustainability strategy is what is commonly referred to as the “energy transformation”. The use of finite fossil fuels is to be shifted to renewable, sustainable sources of energy. At present, Germany now obtains nearly one third of its electricity from renewable sources, and the country has managed to decouple economic growth from energy consumption.

German energy policy is the purview of the Federal Ministry for Economic Affairs and Energy. Most of the principles it has created are now part of environmental law. According to EU Directive 2009/28/EG, member states must develop national action plans aimed at achieving certain national goals when regarding the use of renewable energy sources.

German Renewable Energy Sources Act (EEG)

The goal of the German Renewable Energy Sources Act (EEG) is to promote the production of electricity and heat using renewable sources of energy. The act regulates the preferential dispatching of electricity from renewable sources into the power supply system. The predecessor to the act was the Electricity Feed Law of 1991, the first law of its kind worldwide. To date, it has led to the installing of over 300,000 solar panel systems

⁷ www.bundesregierung.de/Content/DE/StatischeSeiten/Breg/Nachhaltigkeit/0-Buehne/2016-05-31-download-nachhaltigkeitsstrategie-entwurf.html?nn=437032, accessed on 4 July, 2016.

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on German roofs. The electricity buyback model has since been adopted by forty-seven countries.⁸

At the core of the Renewable Energy Source Act is a guaranteed buyback of energy produced as well as a corresponding obligation to pay remuneration to facility operators that is guaranteed for years. Renewable energy sources that according to law are eligible for subsidies are hydroelectric energy, biomass, geothermal energy, wind power, and solar energy.

German Renewable Energies Heat Act (EEWärmeG)

The Renewable Energies Heat Act has been in effect since 1 January, 2009, and is a supplement to the Renewable Energies Act aimed at promoting sustainable development in heating and cooling as well as the development of technologies for improving their usage.⁹

German Energy Conservation Act (EnEG)

The German Energy Conservation Act (EnEG) has its origins in 1976.¹⁰ The intent of the act was to ensure that buildings in terms of their energy demands are brought in line with the current state of technology in a timely fashion. As a result, the act has undergone a number of updates and adjustments. The fourth set of changes took effect on 13 July, 2013. The foundations for the current version of the act are the guidelines set forth by the European Parliament and the Council on the energy performance of buildings (2010/31/EU). Whoever constructs a heated or cooled building after 31 December, 2020 must erect a **climate-neutral building** (in line with “low energy building standards”). The long-term goal is the achievement of low energy building standards by 2019 or 2021 at the latest.

German Energy Saving Ordinance (EnEV)

The first version of the Energy Saving Ordinance dates back to 16 November 2001 and took effect on 1 February, 2002. The Energy Saving Ordinance replaced the Thermal Insulation Ordinance (WSchV) and the Heating Appliance Ordinance (HeizAnIV) and combined the two previous ordinances. It is a part of German commercial administration law and stipulates the structural standard regulations builders must follow for the energy efficient operation of their building or building project. The EnEV applies to residential,

⁸ See <http://www.energie-wissen.info/energiegesetze/erneuerbare-energien-gesetz.html>

⁹ http://www.erneuerbare-energien.de/EE/Navigation/DE/Recht-Politik/Das_EEWaermeG/das_eewaermeg.html

¹⁰ For the text of the law see www.Gesetze-im-Internet.de/bundesrecht/eneg/gesamt.pdf

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office, and – with limitations – factory buildings. Heritage-protected and other buildings such as air-inflated structures, greenhouses, or halls chiefly used for animal husbandry are exempt from the ordinance. The amendment of 2013 implements Directive 2010/31/EU¹¹ concerning the overall energy efficiency of buildings (revised version) and Directive 2012/27/EU concerning energy efficiency effective 1 May, 2014.

German Resource Efficiency Programme (ProgRess)

Already today, our use of natural resources significantly exceeds the earth's ability to regenerate. For this reason, a more sparing and at the same time more efficient use of natural resources will represent a key competency of future sustainable societies.

With the passage of the German Resource Efficiency Programme (ProgRess) in February 2012, Germany was one of the first countries to commit itself to the protection of natural resources based on central themes and action approaches. The Federal Government obligated itself to report every four years on the development of German resource efficiency, to evaluate the progress made, and to continue to develop the Resource Efficiency Programme. This update titled "German Resource Efficiency Programme II" was enacted by the federal cabinet.

Acting on the suggestion of Barbara Hendricks, Federal Minister for the Environment, Nature Conservation, Building and Nuclear Safety, the federal cabinet enacted the second German Resource Efficiency Programme (ProgRess II) in May 2016. It contains important measures aimed at making the production of raw materials and materials usage more efficient and more environmentally friendly. ProgRess II, too, focuses on market incentives and an increase in voluntary measures and initiatives in society as well as the economy. A fundamental enhancement vis-à-vis ProgRess I is that material and energy throughputs are to be considered much more in combination in order to take advantage of synergy effects and recognise and reduce target conflicts in a timely fashion.¹²

Handling of Hazardous Substances

Substances that are harmful to health, carcinogenic, teratogenic, or harmful to the environment are to be avoided in the building process and, if this is not entirely possible, used only together with the appropriate safeguards. The employer is obligated to carry out a risk assessment, to maintain safety limits, and to ensure that only trained personnel are allowed to handle the hazardous substance. Furthermore, the Ordinance on Hazardous Substances also dictates manufacturers' obligations regarding the packaging

¹¹ www.eur-lex.europa.eu

¹² <http://www.umweltbundesamt.de/themen/zweites-deutsches-ressourceneffizienzprogramm>

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and labelling of such materials. The Ordinance on Hazardous Substances dates from 23 December, 2004 and has received some adjustments in light of the European Directives 2002/44/EG and 2003/10/EG (for example, the ordinance on the protection of employees against noise and vibrations).¹³

2.2. Relevant institutional initiatives in support of green building

Only a small selection of the many different programmes and funding opportunities for green building can be presented here.

Funding for green building by the Reconstruction Loan Corporation (KfW)

The KfW's funding programmes rank among the most well-known and most important funding instruments in terms of range and scope – particularly in the private building sphere.

The KfW was originally founded in order to help support reconstruction in Germany after the war. Today the national development bank offers a wide spectrum of programmes in the areas of building, living space, and energy saving that serve the financing of investments in residential properties. Their funding is used to create home ownership, refurbish residential properties, refurbish buildings for energy efficiency, construct new buildings according to the most up-to-date energy-saving technology, convert heating systems to renewable energies, and finance solar systems.

Some of the KfW's funding programmes include:

- *Energy-efficient construction*: the purchase of construction of a KfW energy-efficient building is financed by a loan with attractive interest rates and repayment bonuses.
- *Energy-efficient refurbishment*: improved insulation as well as the installation of solar systems for heating system support is subsidised. As of March 2013, the KfW also finances the installation and expansion of heating systems using renewable energy in residential buildings (for example, solar thermal systems, biomass systems, thermal heat pumps).

The lending criteria defined by the KfW and the German Energy Agency, the *KfW-Effizienzhaus* standards, represent recognised energy standards for buildings.

¹³ www.baua.de/nn_12292/de/Themen-von-A-Z/Gefahrstoffe/Rechtstexte/pdf/Gefahrstoffverordnung.pdf, accessed on 9 August, 2016.

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Buildings with lower energy consumption than approved by the German Energy Saving Ordinance (EnEV) are described as energy-efficient buildings. The state KfW Bank Group defines three standards for new buildings that are supported with low-interest loans or subsidies: “KfW-Effizienzhaus 55”, “KfW-Effizienzhaus 40” and “KfW-Effizienzhaus 40 Plus”. The “KfW-Effizienzhaus 70” standard is no longer supported. The numerical value indicates ratings for energy requirements of the relevant energy-efficient buildings when compared to the legally prescribed upper limit. Thus, a building with the “KfW-Effizienzhaus 70” standard has a yearly energy requirement that is seventy percent of a building with the minimal EnEV standard. In other words, it consumes thirty percent less energy. But this is something that many new buildings nowadays can achieve without additional effort, as for example, modern heating systems generally function much more efficiently than required by law.¹⁴

The energy-efficiency refurbishments and energy-efficient new buildings funded by the KfW have, according to the KfW’s own data from 2011, resulted in a ca. 540,000 ton reduction in greenhouse gas emissions. Furthermore, since 2002 the KfW has presented an annual KfW-Award “*Bauen und Wohnen*” (Building and Living), which includes a substantial cash award, for private individuals and architects who have realised exemplary new buildings, conversions, or modernisations.

Energy performance certificate

According to the EnEV (German Energy Saving Ordinance), an energy performance certificate is obligatory for public as well as private buildings. This obligation was tightened with amendments made to the 2014 EnEV. Owners face fines if they are unable to fulfil this requirement, and real estate advertisements must contain information to the building’s efficiency status. In addition to its practical relevance of evaluating the energy efficiency of existing buildings and identifying starting points for sensible refurbishments, the energy performance certificate also helps create a larger awareness for the need for energy-efficient building and refurbishment.

German Council for Sustainable Development

In April 2001, the Federal Government convened the **German Council for Sustainable Development**. The Council consists of fifteen individuals from the public sphere. It develops contributions aimed at implementing national sustainability strategies, designates fields of action, suggests projects, and makes sustainability an important public concern.¹⁵ The Council also supports research and development and plays an active

¹⁴ <http://www.bauen.de/a/kfw-effizienzhaus-70-besser-bauen-mit-foerderung.html>

¹⁵ See www.nachhaltigkeitsrat.de.

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role in bringing together aspects of sustainability at the European and international levels. A key focus of its 2014–16 work plan is the circular economy, an important lever in the development of green building.

3. MAJOR TRENDS IN THE GREEN BUILDING ECONOMY

3.1. Economic trends in the construction sector

The construction sector will remain on a path of growth and in doing so continue the positive trends of recent years. Even the years of crisis that followed in the wake of the American housing bubble of 2007/08 were overcome with only a few problems. Whereas it is true that the importance of the construction sector in the German gross value added has fallen since 1990, the massive crisis at the end of the previous century and beginning of this century appear to have been overcome. In the mean time the building sector presents itself as a motor for economic growth. All told, it is expected that turnover and employment figures will continue to rise.¹⁶

In the entire EU, more than 56% of fixed investment flows into the construction of residential and non-residential buildings. When it comes to this indicator, Germany is in line with the EU average and there are clear signs that the trend is rising. Currently 57.5% of all investment falls upon the construction sector. However, the rise in this percentage is only partially due to positive developments in building activity. First and foremost, it is cautious investments in long-lived investment and capital goods that has led to below average dynamic in the remaining fixed investments. Business uncertainty vis-à-vis future economic development is leading to significantly higher shares of building investment in fixed investments.

In the first quarter of 2016, business volume in the finishing trade was up 3.2% compared to the first quarter of 2015. Based on preliminary data, the Federal Statistical Office (Destatis) reports that 1.5% more workers were employed in the finishing trade in the first quarter of 2016 than in the same period of the previous year. Compared with the previous year, incoming orders in the main construction trades, per working day and adjusted for price, were 18.3% higher in June 2016. In the first six months of 2016, incoming orders were up by 16% compared to the same period in the previous year.

All of the branches of the finishing trade posted turnover gains. In the building installation sector, in the first quarter of 2016 turnovers were up by 2.5% compared to the same

¹⁶ See PECO-Institut e.V. (eds.): “Sozialer Dialog - Zum Ausgleich von Interessen”, Berlin 2014, pp. 7-8.

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period in the previous year. The greatest increase in turnover took place in other branches of the sector (for example, insulation against cold, heat, noise, and vibrations) at 4.1%.

In other finishing trades, turnovers in the first quarter of 2016 were up 4.1% compared to turnovers in the first quarter of 2015. Within this branch of the trade, turnovers in the areas of painting and glazing rose by 3.6%.¹⁷

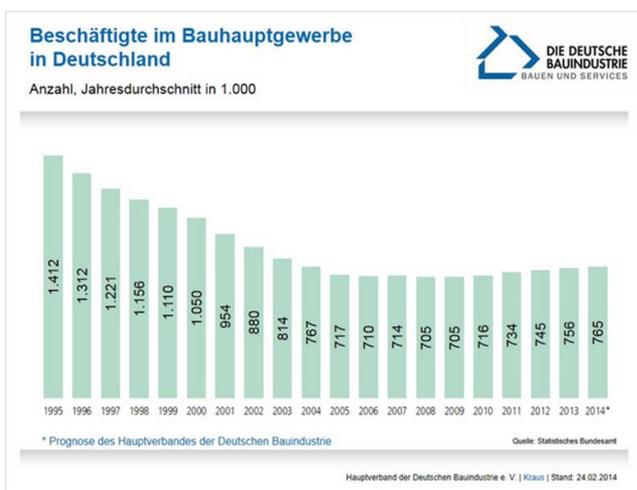
3.2. Employment trends in the construction sector

Labour reserves in the German building market are largely exhausted. In 2014 the number of unemployed skilled builders reached a historic low. Ever more companies appear to be filling the gap in skilled workers by recruiting skilled workers from abroad.¹⁸

The total number of employees subject to social insurance contributions in the building industry was approximately 1.7 million in 2012.¹⁹ Nearly 760,000 people were employed in the main construction trades.²⁰ The percentage share of the entire German labour force was 5.9%.²¹

The chart below illustrates two main points: the building boom in place before the turn of the millennium may be over, but things are once again moving upwards.

Figure 3 – Employees in the main construction trades Number, average per year in 1000



(modified by PECO for translation)

¹⁷ Statistisches Bundesamt: press release from 14 June, 2016. Link: www.destatis.de/DE/PresseService/Presse/Pressemittelungen/2016/06/PD16_201_44131.html; accessed on 23 June, 2016.

¹⁸ Hauptverband der deutschen Bauindustrie e.V.: *Bauwirtschaft im Zahlenbild*, 2015, p.27

¹⁹ Institut für Arbeitsmarkt und Berufsforschung: *Der Arbeitsmarkt im Bausektor 2013*, p.11.

²⁰ The numbers are better documented for the main construction trades. A great number of self-employed individuals are employed in the finishing trades, and their numbers are very difficult to ascertain as it is a figure that constantly changes.

²¹ Hauptverband der deutschen Bauindustrie e.V.: *Bauwirtschaft im Zahlenbild*, 2013

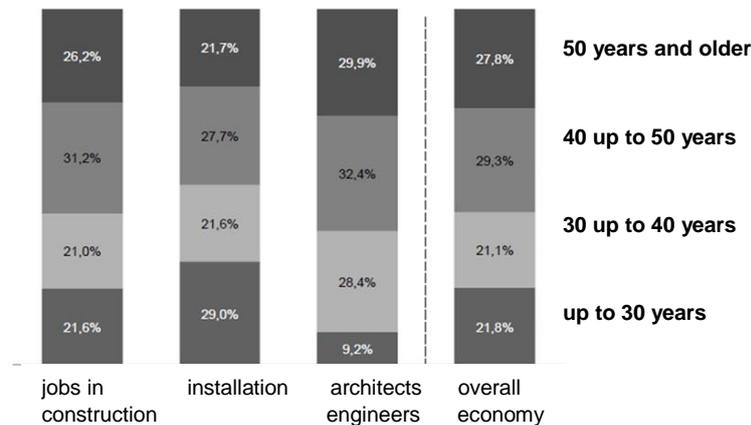
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Most workers in the building sector are employed in small and very small businesses. In 2012 more than 580,000 workers were employed in companies with less than ten employees, and more than 320,000 workers were employed in companies with ten to nineteen and twenty to forty-nine employees. All together they make up 75%.²² Every fifth worker in the building trades is self-employed, whereby the number of self-employed individuals has risen greatly since 2000. This development is primarily evident in the finishing trades (including plasterers, insulation workers, tilers, screed layers, carpenters, roofers, and painters).²³

Overall the number of employees subject to social insurance contributions in the building sector has stabilised, but it still remains under the 2002 level. By contrast, the number of employees subject to social insurance contributions in the overall economy has risen to a significantly higher level than that of 2002.

Unemployment in the building trades has fallen since 2005/06. The unemployment rate is well under the rate among the building trades ten years ago, but it is still higher than the average for all trades. The number of reported open positions has risen significantly since 2004 and again, after the crisis, since 2009.

Figure 4 – Age distribution of employees in the main building trades²⁴



Remarkable is the high average age of employees in the building trades, a phenomenon that can be observed in the overall economy as well. More than 40% of workers in the main building trades are forty and over. A retirement age of ca. 57.6 in building above and below ground is indicative of a serious problem for the future. In the finishing trades,

²² Institut für Arbeitsmarkt und Berufsforschung: *Der Arbeitsmarkt im Bausektor 2013*, p.19.

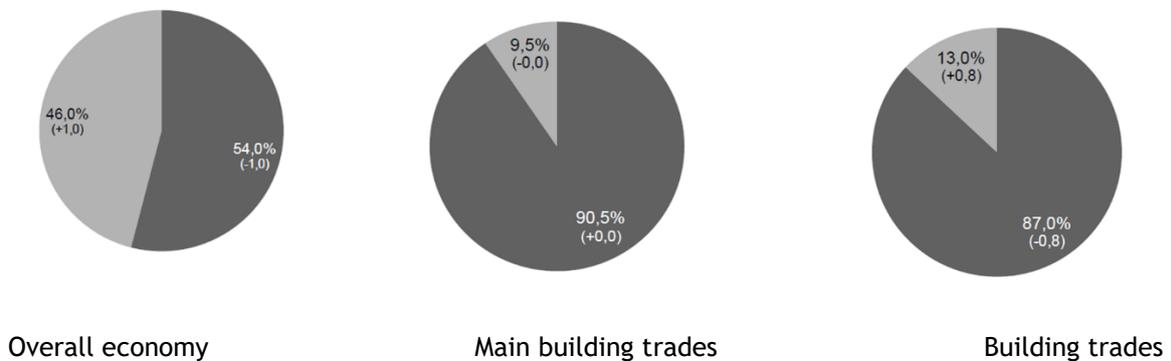
²³ Institut für Arbeitsmarkt und Berufsforschung: *Der Arbeitsmarkt im Bausektor 2013*, p. 6.

²⁴ Ibid., p. 29.

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where more than 35% of all employees are older than forty, the situation is somewhat better. The share of female employees subject to social insurance contributions in the building sector is extremely low. Whereas their share in the overall economy is 46%, in the building sector it is 13% and in the main building trades only 9.5%.

Figure 5 – Employees subject to social insurance contributions by gender with the change in percentage vis-à-vis 2002 in percentage points (in brackets), reference date 30 June, 2012²⁵



In larger companies the percentage of older employees is greater than in smaller businesses; the same is true of the building trades as a whole, but only in a very limited sense in the main building trades. Whereas in 2012 only 23% of workers in very small businesses (up to nine employees) were fifty and older, their share in companies with more than 500 employees was 31%. These numbers seem to support the line of IG BAU’s reasoning that the small-business oriented structure of the building sector is a problem for the shaping of transitions from working age to retirement.²⁶

This situation is particularly problematic as it describes a trend in recent years and also highlights the mid- to long-term necessity of finding new workers for the building trades, which, in light of demographic transformations, will not be easy. This is also reflected by the increase in open positions, which, in the fourth quarter of 2012, was 14.6% higher than the same quarter in the previous year.²⁷

²⁵ Institut für Arbeitsmarkt und Berufsforschung: *Der Arbeitsmarkt im Bausektor 2013*, p. 27

²⁶ IG BAU: *Rente muss zum Leben reichen! Entschließung des 7. Außerordentlichen Gewerkschaftstages der IG BAU* on 31 March, 2012.

²⁷ Institut für Arbeitsmarkt und Berufsforschung: *Der Arbeitsmarkt im Bausektor 2013*, p. 29.

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The trend in training figures throughout Germany shows a light decrease and/or stagnation in new articles of apprenticeship in construction above and below ground and a significant decrease in the finishing trades. In Bavaria, however, a slight increase has been noted.

When it comes to realising workers' interests, the low number of companies with workers' councils represents a serious drawback, for it not only means a fundamental corrective for undesirable developments is lacking when it comes to, for example, questions of labour and health protection, but it also means there is a lack of support for the development of strategies that could make the workplace more attractive.

3.3. Needed skills and training

Significance of education in the field of green building

A German Environment Agency study from 2011²⁸ asserted that the shortage of skilled workers is hindering energy-efficiency refurbishments and urged that energy efficiency must play a greater role in vocational training and further education.

Construction defects that may circumvent the actual goal are not uncommon in climate-friendly buildings.²⁹ Improper building construction and refurbishment can lead to a number of complications. In order to achieve Germany's climate protection targets, the high potential for energy savings offered by the refurbishment of old buildings must be better exploited. New demands are not only being placed on construction techniques, but also on the necessary professional credentials of employees.³⁰

One important approach to reinforcing green building is the reorientation of education in the building trades. In Germany, vocational education takes place within the framework of a dual system: trainees receive the practical part of their education in the companies, whereas the theoretical part is the responsibility of the vocational schools. At least 50% of the training period is spent in the companies. This dual educational system plays a major role in providing professional training to large portions of the working population and in doing so offers a boost to Germany's innovation potential.³¹

²⁸ See www.uba.de/uba-info-medien/3970.html.

²⁹ See for example "Dekra Schadensbericht 2008".

³⁰ On the challenges faced by the construction sector and the role of educational activity in the process, PECO presented the 2014 study "Bildungsarbeit in der bayerischen Bauwirtschaft".

³¹ Deutscher EQR-Referenzierungsbericht, May 2013, www.dqr.de/media/content/Deutscher_EQR_Referenzierungsbericht.pdf, accessed on 23 August, 2016.

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While German educational policy is the purview of the German federal states and the school systems can differ from one another rather significantly, training regulations are determined at the federal level.

European and German Qualifications Frameworks

The European Qualification Framework (EQF) is an instrument aimed at making national qualifications comprehensible throughout Europe and thus encouraging mobility among workers and trainees as well as lifelong learning. It is the reference framework for comparing the different national qualification systems. The core of the EQF consists of eight levels of reference. These describe learning results – in other words, what the trainees know, understand, and are capable of implementing. Accordingly, the learning outcomes for the individual levels are described in terms of three pillars: “knowledge”, “skills”, and “competences”, whereby “competences” describes the adoption of responsibilities and self-reliance.

Like the EQF, the German Qualifications Framework (DQR) also defines eight levels. These however are structured differently from the EQF levels. The DQR describes four pillars (knowledge, skills, social competences, self-reliance) to better represent the learning outcomes sought by the German educational system. The DQR thus seeks to reinforce the fact that a **comprehensive understanding of competences** is of central importance to the German educational system.³²

A similar approach is used by educational concepts that seek to teach trainees in the building trades a comprehensive understanding of green and sustainable building. The main focus is on themes such as resource efficiency, recycling economy, and ecological insulation materials.

The example of KOMZET

The competency centres for vocational education in the network of building and energy seek to cooperate closely in order to improve their educational and advisory work. This is manifested in the exchange of experts, course concepts and materials, the development of standards, the shared development and testing of training courses, materials, and media. This is intended not only to optimise quality and work outcomes, but also to make competences and educational offerings available to a wide and supra-regional professional public.

³² <http://www.dqr.de>

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In addition to expanding their professional expertise, the network partners promote their development in cross-sectional fields of activity and to this end exchange experience, outcomes, and instruments. These fields of activity include monitoring, knowledge management, marketing, use of information technologies, quality development, organisational and personnel development, knowledge sharing, and sustainability.³³

3.4 Changes and innovations in the green building economy

Technological development is moving rapidly ahead, and this offers a wide range of innovations that are of use in green building. These include innovations in the areas of facade insulation (for example, wood-plastic composite cladding or recyclable sheets of rock wool), heating technology, or the use of recycled building materials.³⁴ For example, straw bales are now approved for regular use as a building material in Germany, but there are also other innovative materials, such as panels and assembly kits for entire houses or prefabricated wall elements.³⁵ Over the last ten years, the number of patents in the field of green building has tripled in Europe. The most activity was seen in the following areas:

- Heating, ventilation, and climate-control technology
- Energy-efficient insulation
- “Green” lighting
- The use of renewable energy³⁶

Research institutes such as the Fraunhofer Institute are exploring innovative technological solutions in the field of sustainable building. As early as ten years ago, the architect Werner Sobek³⁷ designed the House R128 in Stuttgart based on the “triple-zero principle”, according to which a structure may not use more energy than it produces, may not produce carbon dioxide, and must be simple to dismantle and sort for recycling. The Effizienzhaus Plus, an energy-plus-house in Berlin commissioned in 2011 by the Federal Ministry for Transport, Building, and Urban Development, produces twice as much energy as its occupants’ consume. Furthermore, the home’s and automobile’s energy streams are connected; the parking space in front of the house is surfaced with induction mats,

³³ <http://www.komzet-netzwerk-bau.de>

³⁴ See <http://www.oekologisch-bauen.info/baustoffe/dach/fassaden/fassadenplatten.html>.

³⁵ Additional information concerning straw-bale construction at www.fasba.de or www.oeko-bauen-bilden.de

³⁶ See European Patent Office: www.epo.org/news-issues/technology/sustainable-technologies/green-construction_de.html.

³⁷ See also the Institute for Lightweight Structures and Conceptual Design (ILEK) at the University of Stuttgart: <http://www.uni-stuttgart.de/ilek/>

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meaning that an electric car can charge its batteries on renewable energy from the house's own batteries.³⁸

In 2007 and 2009 students at the Technische Universität Darmstadt won first prize at the Solar Decathlon in Washington in 2007 and 2009 with their energy-plus houses.

BAU trade fair in Munich

BAU, the World's Leading Trade Fair for Architecture, Materials, and Systems, takes place every two years. In 2015 it attracted 2,000 exhibitors and 250,000 visitors. It offers a communication platform for anyone active in the area of green building.³⁹ For example, under the motto “plan for sustainability – develop innovation”, the German Sustainability Council together with partners from the building industry and planning offered 100 m² of materials illustrating the potential for innovation in the growing market of sustainable building. Topics included the correct construction of façade elements, which are supposed to serve as a bioreactor, or insulating concrete as a structural element.

3.5 Drivers and barriers for the development of the green building

National and regional levels: Tax incentives are off-track

Economic instruments direct the behaviour of consumers and producers by means of financial incentives. It is important to ascertain whether these instruments – such as taxes or subsidies – set false signals for a development in the areas of green building and sustainable living. The abolishment of the grant scheme for first-home buyers and the reduction of the commuting allowance are both positive examples, as their absence helps to counter processes of urban sprawl. In order to consistently promote existing measures, the German Environment Agency (UBA) suggests repealing the housing construction subsidy, which in 2006 amounted to ca. €500 million, or to no longer support building savings when it comes to employee savings supplements. Public funds should no longer support regionally undifferentiated incentives promoting residential construction.⁴⁰

Obstacles to green building in the companies: a lack of know-how

Although a large share of craftsman's firms expect a rise in commissions in the area of sustainable building, workers have yet to develop sufficient know-how in the field. Here we see necessity of systematic further education. Clients expect comprehensive consultation, which is something individual craftspeople often cannot provide.

³⁸ www.land-der-ideen.de/sites/default/files/210x297_BMV_LDI_InnoDtBroschur.pdf

³⁹ See www.bau-muenchen.com.

⁴⁰ See Umweltbundesamt (eds.): Nachhaltiges Bauen und Wohnen 2010, p. 30.

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Energy counselling

When it comes to homeowners who wish to refurbish, in most cases the house is only partially refurbished. This represents a problem, for energy-efficiency refurbishment makes more sense when refurbishment takes into account the entire structure. However, private persons are usually overwhelmed by the complexity of the issue, and the firm hired to carry out the job might not always bring with it the necessary professional expertise. It is for this reason that so many energy consultants are available, but it must be said that the range of consultants is large and qualifications are not transparent. The energy consultancy market in Germany is subject to inconsistent quality standards and uncertified job titles (“energy consultant”, for example). On the other hand, clients’ willingness to pay for counselling is also quite low. At present, energy consultancy remains a “low-interest product”, meaning the demand must first be created.⁴¹ Consumers can apply to the KfW for grants when it comes to professional energy-efficiency planning and supervision by an independent specialist as well as for the preparation of certificates.

⁴¹ See www.bfee-online.de/bfee/informationsangebote/publikationen/studien/marktanalyse_edl_energieberatung.pdf.

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4. SOCIAL DIALOGUE AND GREEN BUILDING

4.1. Industrial relations systems at country level

In Germany, the trade unions, on the one hand, and the employers' associations, on the other, are viewed as "social partners". As an instrument aimed at overcoming the old, class-based ways of thinking, the two sides, as parties to collective agreements, are obligated by German law "to protect and promote the working and economic conditions" within the framework of the freedom of association and autonomy in collective bargaining.⁴² The social partners thus fulfil an important role in maintaining a functioning social market economy.

The trade union Bauen Agrar Umwelt (IG BAU)

The trade union IG BAU has existed in its current form since 1 January, 1996. It was created by the fusion of IG Bau-Stein-Erde (IG BSE) and the Gewerkschaft Gartenbau, Land- und Forstwirtschaft (GGLF) – two trade unions with a long history reaching back into the nineteenth century. The fundamental idea behind this new trade union is the "alliance of labour and the environment".

According to the organisation's statutes,⁴³ IG BAU is responsible for the following economic and administrative sectors: building trades, building material industry, waste disposal and recycling, agriculture and forestry, building cleaning and management, as well as environmental and nature protection. It thus represents workers such as construction workers, painters and varnishers, glaziers, roofers, scaffolders, cleaners, gardeners, horticulturalists and landscapers, florists, forestry workers, and employees in cement factories and landscape preservation associations. IG BAU is a grassroots organisation with numerous chapters at the city and district levels as well as professional groups and trade union memberships in a number of firms.

Hauptverband der deutschen Bauindustrie (The Association of the German Construction Industry) (HDB)

Together with its eighteen ordinary and extraordinary member associations, the Hauptverband der Deutschen Bauindustrie represents the interests of 2,000 large and medium-sized construction firms.⁴⁴ As a trade association, it represents the interests of the German construction industry vis-à-vis lawmakers, governments, and administrations at the national and European levels. Its goals are the need-based investment policy on

⁴² See German Basic Law: article 9, paragraph 3 GG.

⁴³ IG BAU statutes, see www.igbau.de/Die_Satzung.html, November 2013.

⁴⁴ www.bauindustrie.de

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behalf of the federal government, the states, and communities, an appropriate awarding of public construction contracts, and investment-friendly basic frameworks in the awarding of construction contracts and construction contract law as well as in tax, competition, and business law.

As an employers' association, the HDB represents one of the partners in collective bargaining agreements, is active in the areas of company and industry-wide training, and campaigns against illegal practices.

The Zentralverband Deutsches Baugewerbe (Central Association of the German Building Industry, ZDB)

The Zentralverband Deutsches Baugewerbe is the largest and oldest builders' confederation in German. It represents the interests of 35,000 mid-sized, owner-operated construction companies⁴⁵ from diverse branches of the industry ranging from classical building, road, and underground construction to demolition. Companies represented include those working in the areas of tiling, classical carpentry, timber construction, well construction, special underground engineering, screed floor layers, turnkey builders, as well as firms offering services ranging from project handling to facility management. The ZDB's members include smaller owner-operated craft firms as well as larger mid-sized companies.

Der Bundesverband der deutschen Zementindustrie (Federal Association of the German Cement Industry, BDZ)

The Bundesverband der Deutschen Zementindustrie is an economic association which represents the interests of its members in their interactions with the political, business, and public spheres. Its main focuses include challenges arising from the areas of industrial and construction policy as they relate to issues concerning raw materials, energy and the environment, residential building, infrastructure, and architecture. The BDZ represents fifteen cement producers with a total of forty-five cement factories. The BDZ supports sustainable production and the use of cement-bound building materials. It cooperates closely with the Verein Deutscher Zementwerke (Association of German Cement Works, VDZ), the branch's technical and scientific association.

4.2. Role of the social dialogue in support of the green economy and green building

From the union's point of view, economic growth has to be reconciled with environmental protection. As early as 1996, the manifesto of the DGB (Deutscher Gewerkschaftsbund) of 1996 calls for an equal treatment of Ecology, Economy and Social Affairs in

⁴⁵ www.zdb.de

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sustainability. Its aim is to overcome unemployment and to reconcile economic prosperity and environmental protection. From a union's perspective, the social aspects of sustainability have clearly to be strengthened.

Thus, in accordance with their relevant political remits, the social partners have approached the topic of green building from different starting positions, but it now appears as if they have achieved a shared understanding of a number of issues. Key words in this regard are health protection and workplace security as well as resource efficiency aimed at lowering costs and shoring up innovations connected with competitive advantages and job security.

Sustainability and the cement industry

An example for social partnership on the issue of green building

In 2002 the Socio-Political Working Group of the German Cement Industry (SPADZ) together with the Federal Association of the German Cement Industry (BDZ) and the Association of German Cement Works (VDZ), the IG BAU, and the Industriegewerkschaft Bergbau, Chemie, Energie (Trade Union for Mining, Chemistry, and Energy, IG BCE) produced materials documenting the relationship between sustainable development and the cement industry in order to create a foundation for better dialogue concerning sustainable development. In it the social partners explicitly stress that sustainable development/green building is to be viewed as a process that must encompass the entire value chain of cement-bound building materials.⁴⁶

4.3 Drivers and barriers for the social dialogue on green building

In conclusion, a number of drivers and barriers for the social dialogue on green building were identified by German social partners and experts in the course of the project. As favourable conditions, **the national legislation** on environmental issues and energy saving regulations present good framework conditions for green building. As well, the **economic situation** in Germany, with rising numbers in building and a further growing demand for residential buildings in urban areas, generally supports developments in green building. As a third driver, the **technological research** and development was identified to foster new materials, better planning in the building sector (as BIM – Building Information Modelling) and innovations in green building.

⁴⁶ See Nachhaltigkeit und Zementindustrie – Dokumentation von Beiträgen und Handlungsoptionen. Published by the Sozialpolitischen Arbeitsgemeinschaft der Deutschen Zementindustrie et al., edited by Ralf Löckener and Birgit Timmer, Düsseldorf: Verlag Bau + Technik, 2002

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The **complexity of green building**, the need for a comprehensive approach for building projects and the lack of expert knowledge is a barrier that needs to be overcome by further efforts in learning and vocational training. In Germany, the **prevalence of small enterprises** in the building sector hinders a swift adaptation to new forms of sustainable building and energy-saving buildings. But perhaps the most important and difficult to overcome barrier in green building is the **lack of a common understanding**. Although sustainability is a catch word present in every concept and official brochure on building for more than a decade, there is often too little knowledge about green building measures and how the various trades on a building site should work hand in hand to ensure quality and effectiveness of sustainable building.

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5. GUIDELINES FOR SOCIAL DIALOGUE IN GREEN BUILDING

5.1 Tools to strengthen the social dialogue

For the social partners in Germany, the national committees on education and vocational training represent the most important arenas to discuss and to promote Green Building and thus to also further strengthen the social dialogue. By fostering holistic thinking rather than expert knowledge and by strengthening the notion of the circular economy, the social partners should take their chance to support the development of Green Building and employment opportunities in the building sector in general.

Better cooperation between social dialogue partners, science and industry is necessary to improve quality of work and working conditions in a changing environment. A special focus should be put on the digitalisation of the building sector and BIM (Building Information Modelling) as the major tool in big building companies and projects of the public sector to make building more sustainable.

Exchange on the European level, as this project shows, is vital, to achieve a common understanding about the challenges and demands in adapting the building sector to the requirements of a sustainable economy, also with view to labour migration within the European Union.

5.2 Areas of Action

Policies and legal framework

Policies on Green Building need to be revisited. In Germany, the great numbers of regulations on energy-saving and Green Building often hinders innovation and technological development. It is much more effective to make performance standards binding than to regulate the material to be used. A well-known example is the size of insulation used in cladding design. The regulations on insulation for facades with polystyrene require an increased size with every new regulation - due to lobbying of producers of polystyrene, the windows of renovated buildings look almost like embrasures of a medieval castle. The additional effect of such an extra-thick insulation for a 19th century building with solid brick walls may be little if at all. For efficiency it makes no sense to generally regulate sizes of insulation as buildings have very different structures and measures for energy-saving have to be adapted appropriately.

Public projects are a major tool to invent new standards and materials in the building sector. Social Partners should use their impact to support the promotion of alternative

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materials and building procedures – especially to set standards with the notion of the circular economy and to promote recycled or recyclable materials and take the consumption of grey energy into account.

Working Conditions and New Skills

The prevalence of irregular or illegal employment and sub-contractor chains in the building sector is a heavy burden in regard to quality of work and working conditions in general but even more so when it comes to innovations, new techniques and materials in building as in green building. It is strongly supported by all social partners to fight irregular employment.

From the perspective of the social dialogue, the policies on education and qualification are the most relevant ones to foster green building. Improvements in vocational training and the integration of new skills into job profiles and training curricula are necessary. As discussed in the second national workshop in Berlin, e.g. the German Chamber of Crafts promotes development in new job profiles with the set-up of a new curriculum for a building energy craftsman (*Gebäudeenergiehandwerker*) to better meet the requirements of modern building.

Another challenge is the German Crafts Code that bases on decades-old regulations and needs to be adapted to modern technology and work.

Technology, Innovation of the productive process

As shown in the earlier parts of the report, there is a lot of technology development and research going on in Germany, supported by funding programs and fostered by a long history of environmental policies. There is, however, always the challenge to integrate the various activities, to connect universities, producers and consumers, to make technological innovation productive and to make new technologies and materials part of the mainstream.

In the course of the second national workshop it was part of the discussion that the usage of un-proven technology is a most frequent problem in building. As well, the application of new technology or new materials often creates dependence upon specific producers. A true competition is not existent as long as there are only a very few producers offering new materials or technology.

Cultural Dimension

With regard to the cultural dimension the social-cultural change must be reinforced: Sustainability has to be established as leading notion in society (*Leitgedanke*).

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Sustainability in the building sector means also to observe the notion of the circular economy and to be aware of the ecological footprint of the building process and of buildings. To better promote this understanding in all parts of society is a challenge that the social partners have to meet. The demographical structure of workers in the building sector as well as the prevalence of small enterprises in Germany makes it more difficult to disseminate technological innovations and to adapt to the digital change.

5.3 Directions for the Social Dialogue at European Level

Following the two national workshops as well as several interviews with German experts, representatives of workers, employers and research, these are recommendations for a Social Dialogue on Green Building and problems to solve:

- Tax incentives and legal regulations must be designed to bolster green building.
- Educational policy must reinforce sustainability themes in curricula, particularly in the case of dual education. To date, vocational training has not been integrated into national sustainability strategies and programmes; vocational training policy and environmental policy are often not or insufficiently attuned to one another.
- There is no coherent understanding of environmentally-friendly workplaces or environmental occupations.
- The notion of green building as a cross-sectional task must be reinforced. In addition to developing green occupations and ecological vocational training, it is also important that existing occupational competences are expanded with regard to the demands of green building.
- The lack of skilled labour as well as the prevalence of illegal employment poses a serious obstacle in the field of green building.
- It is often the case that a conflict exists – also within trade unions – between the interests of quick construction (for example, to overcome a housing shortage) and green building. The regulations governing green building are viewed as burden within the planning process making it more complicated and costly or as factors leading to higher rents. Social and ecological aspects of residential construction are in danger of being pitted against one another.

A general problem faced by the areas of environmentalism and sustainability is the fact that the costs of non-sustainable behaviour, such as health and environmental problems, do not necessarily manifest themselves in the places they are created. The building sector is therefore called upon to take into account their own responsibilities vis-à-vis these issues.

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Country Report and Guidelines on social dialogue

Italy

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1. THE CONSTRUCTION SECTOR: MAIN FEATURES¹

Since 2008, the main economic and employment dynamics in the construction sector recorded a downward trend in its two major components, housing and non-residential buildings and infrastructure. In fact, the crisis had negative effects on production (down 41.5%), profit (-35%) and employment (-25.3%), resulting in the closure of about 80,000 businesses (12.7%) (EC 2016, ANCE 2015b, 2016b, 2016c). The modest positive signs in the Italian economy in 2015 (where industrial output increased by 1.1% on 2014) have still not been reflected in the construction sector, where production in 2015 declined by an average of 1.7% on an annual basis, continuing the negative trend of previous years (ISTAT 2016b). However, in the final months of 2015 and early 2016, the sector showed a few signs of slight recovery: in February 2016, for example, the volume of construction production increased by 0.6% on average over the previous three months (ISTAT 2016a, b, OISE 2015). Construction still represents a major component of the national economy, **6.2% of the GDP in 2015** (ANCE 2016a). The **composition of production in the construction industry** in 2011, amounting to 255,297 million euros, is shown in Table 1 (ANCE 2015b).

Table 1 – Composition of production in the construction industry – 2011

INTERMEDIARY COSTS (67.9%)		Thousands of €	%
	- PURCHASES OF GOODS AND SERVICES	172,225	67.9
	- domestic production	165,959	65.0
	- imported	7,265	2.9
ADDED VALUE (32.1%)	LABOUR COSTS	37,581	14.7
	- Gross remuneration	26,535	10.4
	- Social security/NI contributions paid by employers	11,046	4.3
	OTHER INCOME AND DEPRECIATION	41,817	16.4
	OTHER NET TAXES ON PRODUCTION	2,674	1.0
	TOTAL PRODUCTION	255,297	100.0

Source: ANCE 2015b

¹ This research report on construction and social dialogue in Italy has been compiled using information gathered by consulting documentary sources and by interviewing a selection of qualified experts. The interviewees were: Ermira Behri (Secretary, *Fillea CGIL Nazionale*), Giovanni Carapella (Director, *FORMEDIL Nazionale*), Gianluigi Coghi (Vice-president, *ANCE Nazionale*), Gianni Meneghini (Vice-president, *FBM Spa*), Gianmichele Panarelli (Architect, *Chieti University*), Claudio Sottile (in charge of EU and international policies, *Filca CISL*), Massimo Trinci (in charge of international policies, *Feneal UIL*), Edoardo Zanchini (Vice-president, *Legambiente*).

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In 2015, the industry had 1,444,700 **employees** (EUROSTAT 2016), almost 25% of industrial employees and 6.6% of workers in all sectors of economic activity. Whilst industry saw an increase in both working hours (+0.1%) and working units (+0.2%), in construction these decreased by 0.3% and 0.1% respectively (ISTAT 2016b). In 2016, the construction segments employed 1,346,000, 5.91% of the total employed, lower therefore than 2015 and 2014, confirming a further employment squeeze in the sector. As far as **construction companies** are concerned, Italy has a very fragmented production fabric and it is one of the European countries with the **largest number of small- and medium-sized businesses** (ANCE 2015 b). According to data from ISTAT (the Italian National Statistical Institute), in 2012 there were 572,412 companies active in the sector, with 1,553,165 employees. 96% of these businesses (548,709) had fewer than 9 employees; 3.9% (22,387) had between 10 and 49 employees and only 0.2% (1,316) had more than 50. The **average number of employees** per company is 2.7 and remains among the lowest in Europe. Along with the continuation of the crisis, submerged employment – **irregular labour** – has risen again: according to ISTAT, since 2012, the percentage in the sector (15.6%) has returned to be more than the average figure for the totality of economic sectors, amounting to 14.9% (ANCE 2015b).

Italy has 12 million **residential buildings** consisting of 31 million homes, 77% of which are occupied by residents. 60% are single-family homes, while large condominiums represent 2% of the housing stock. The total inhabited area amounts to 2,397 million square metres, with an average value of just below 100 square metres per dwelling. 18% of existing buildings were built before 1918, the large condominiums appeared since the period following the Second World War, while 52% of homes were built between 1946 and 1980 (RSE 2015, ISTAT 2014b). Non-residential buildings account for 15.7% of the total (approximately 2.7 million), with 65,000 offices, commercial buildings occupying 165 million square metres, 51,000 schools and 25,800 hotels (ENEA 2016a, ISTAT 2014b). In line with the European trend, the sector has a primary energy consumption of **37%** and contributes **41% of greenhouse gas emissions** (I-TOWN 2016). **Energy efficiency investments** have been increasing from 2012 to €5.6 billion in 2015, divided between residential (53%), industrial (32%) and tertiary and offices (less than 14%) (Energy&Strategy Group 2016).

The activities of **voluntary certification of the sustainability of the constructed** refer to the national protocol *ITACA* (Institute for Transparency in Procurement and Environmental Compatibility), as well as the international protocols LEED (Leadership in Energy and Environmental Design) and BREEAM (Building Research Establishment

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Environmental Assessment Method). The most widespread certification system is the *ITACA Protocol*, developed in 2002 and adopted by numerous regional and municipal administrations through regional laws, building regulations, as well as in tendering processes and urban planning (I-TOWN 2015).

2. NATIONAL POLICY FRAMEWORK FOR SUSTAINABLE CONSTRUCTION

Public policies having to do to with construction activities refer to the various ministries and national agencies (including ENEA, the National Agency for New Technologies, Energy and Sustainable Economic Development), as well as the regions, autonomous provinces and municipalities. This **fragmentation of responsibilities** and, above all, the **lack of guidance and coordination of activities** are an obstacle to sustainable development the sector (OISE 2014, 2015).

2.1. National Policies

Building is an important tool in achieving energy efficiency targets for the country, as indicated by the **2017 National Energy Strategy (SEN)** currently being finalised², which considers the upgrading of the built patrimony as an important opportunity to revitalise the building sector as well as improve the territory.

Sustainable construction initiatives include the government programme *STREPIN – National Strategy for Energy Renovation of Public and Private Buildings* (promoted by the Ministry of Economic Development-MISE); *PANZEB – The National Action Plan to increase Nearly Zero-Energy Buildings* (MISE); and *PREPAC – Energy Regeneration Programme for the Buildings of the Central Public Administration*, coordinated by MISE-MATTM (Ministry of the Environment, Territorial and Marine Protection) cabin. **STREPIN** estimates energy savings expected by 2020 in the sector thanks to measures that have already been activated for energy efficiency. **PANZEB** assesses the energy performance of buildings in different types of use and climatic zones, estimates the extra costs needed, compared to current levels, for the construction of new nZEB, nearly Zero-Energy Buildings, or for the transformation of existing buildings into nZEB, and traces national developments and guidelines to increase the number of nZEB through the regulatory and incentive measures that have been made available. **PREPAC** covers about 3,500 buildings occupied by the central public administration to be renovated at a rate of at least 3% per year over the period 2014-2020 (Bonacci 2016). Coordination and monitoring of the progress of the programme are overseen by a steering committee

² <http://www.sviluppoeconomico.gov.it/index.php/it/energia/strategia-energetica-nazionale>

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from the Ministry of Economic Development and the Ministry of the Environment³. Although buildings play a key role in the **circular economy** (ANCE 2016b) and there is a lack information on over 90% of the waste produced in Italy (Legambiente 2016), **our country still does not have a national strategy for resource efficiency**, although it has adopted some national targets on the issue (EEA 2016). In July 2017, the Ministry of Economic Development and the Ministry of the Environment launched a public consultation on the document “Towards a model of Circular Economy for Italy” defining the country’s strategic positioning in relation to the issue, and this represents an important element for the implementation of a national strategy for sustainable development. As regards sustainability, MATTM⁴ is currently putting the finishing touches to the **National Strategy for Sustainable Development**, in line with the goals of 2030 Agenda of the United Nations.

Among the national policies that have indirect effects on the construction sector, mention ought to be made of the **Industry Plan 4.0** for 2017-2020, launched by the Government through the Ministry of Economic Development in September 2016 to encourage productive and technological change. Based on interventions to support productivity, flexibility and competitiveness, the Plan is aimed at businesses involved in the innovations introduced by the Fourth Industrial Revolution. The measures envisaged have been organised around two key areas (innovative investments and skills) and two accompanying areas (enabling infrastructure and public support instruments). Thanks to technological progress, along with the **Digital Agenda** (launched in Italy in 2012), Industry Plan 4.0 supports, in reality, the **digital transition** which is indispensable, among other things, for transforming urban environments into **smart cities**, of which smart and sustainable building is a fundamental component.

It is within this framework that the **norms regarding sustainable construction** are laid down, norms which are articulated in a series of national, regional and local laws and regulations.

2.2. Main regulations and legislative activity at national level

In recent years, the **national regulatory framework** has sought to provide greater awareness of the energy performance of buildings to citizens, operators and public administrations, also with a view to integrating the dimension of energy quality into the

³ <http://www.sviluppoeconomico.gov.it/index.php/it/energia/efficienza-energetica/pubblica-amministrazione>

⁴ <http://www.minambiente.it/pagina/sviluppo-sostenibile-e-rapporti-internazionali>

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commercial value of properties (Bonacci 2016). The principle legislative measures on the energy efficiency of buildings from 2005 until June 2015 are shown in the table below.

Table 2 – Legislative measures on the energy efficiency of buildings from 2005 to June 2015

<i>Date</i>	<i>Abbreviation</i>	<i>Object</i>
August 19, 2005	D.Lgs 192/2005	Implementation of Directive 2002/91/EC on energy efficiency in buildings (<i>Italy introduces the new European provisions; many aspects are assigned to future implementing decrees</i>)
June 25, 2008	D.Lgs 112/2008	Implementation of Directive 2006/32/EC on the efficiency of final energy uses and energy services and the repeal of Directive 93/76/EEC (<i>Introduction of the “certification body” and the obligation to validate commercial software</i>)
April 2, 2009	DPR 59/2009	Regulation implementing Article 4, para. 1, letters (a) and (b) of D.Lgs 192/05 on the implementation of Directive 2002/91/EC on energy efficiency in buildings (<i>First implementing Decree of D.Lgs 192/05 with a new framework of mandatory provisions in lieu of the “transitional” provisions of Appendix I of D.Lgs 192</i>)
June 26, 2009	DM 26/6/2009	National Guidelines for Building Energy Certification (<i>Another Implementing Decree of D.Lgs 192/05 defining the methodologies to prepare the Energy Certification</i>)
March 3, 2011	D.Lgs 28/2011	Implementation of Directive 2009/28/EC on the Promotion of the Use of Energy from Renewable Energy, amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC (<i>The decree modifies the rules on the obligations for coverage of energy from renewable sources – Article 11 and Appendix 3 – and for energy certification when selling and leasing – Article 13</i>)
November 22, 2012	DM 22/11/12	Amendment of the Decree of June 26, 2009, on the National Guidelines for Building Energy Certification (<i>The Decree modifies the National Guidelines and specifically annuls the possibility of the self-declaration of G class for a building</i>)
January 25, 2013	DM 22/11/12	Amendment of Appendix A of D.Lgs 192/05 implementing Directive 2002/91/EC on energy efficiency in buildings (<i>the decree modifies Appendix A</i>)

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		<i>of D.Lgs 192/2005 “Further definitions”)</i>
April 16, 2013	DPR 74/2013	Regulation defining the general criteria for the exercise, operation, monitoring, maintenance and inspection of thermal plant for the winter and summer of buildings and for the preparation of hot water for sanitary-hygiene purposes, in accordance with Article 4, para. 1, letters a) and c) of D.Lgs 192/05
April 16, 2013	DPR 75/2013	Regulation governing accreditation criteria to ensure the qualification and independence of experts and bodies to whom building energy certification is entrusted, pursuant to Article 4, para. (1), letter (c) of D.Lgs 192/05
June 4, 2013	DL 63/2013	Urgent provisions for the transposition of Directive 2010/31/EU of the European Parliament and of the Council of May 19, 2010, on the energy performance of buildings for the definition of infringement procedures by the European Commission and other provisions on social cohesion (<i>The decree incorporates the European Directive 31/2010/EU. The document contains the changes to D.Lgs 192/05 and the extension of tax incentives</i>)
August 3, 2013	Law 90/2013	Conversion, with modifications, of DL no. 63 of June 4, 2013
February 21, 2014	Law 9/2014	Conversion into law of DL no. 145 of December 23, 2013 for urgent action to start the “Destination Italy” plan (<i>This text covers, inter alia, energy performance certificates and the qualification of the energy certifiers</i>)
July 4, 2014	D.Lgs 102/2014	Implementation of Directive 2012/27/EU on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC (<i>The Decree establishes a framework of measures to promote and improve energy efficiency with a view to achieving the targets to be achieved in 2020</i>)
January 9, 2015	DM 9/1/2015	Energy efficiency (<i>The decree identifies the modes of operation of the steering committee established by Article 4, para. (4) of D.Lgs 04/07/2014 no. 102</i>)
June 26, 2015	Inter-Ministerial Decree	Application of the methodologies for calculating the energy performance of buildings and the definition of regulations and minimum requirements for buildings

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	26/6/2015	
June 26, 2015	DM 26/6/2015	Adaptation of the Decree of the Ministry of Economic Development, June 26, 2009 – National guidelines for the energy certification of buildings
June 26, 2015	Inter- Ministerial Decree 26/6/2015	Schemes and methods of reference for the compilation of the technical design report for the purposes of applying the regulations and minimum requirements for energy performance of buildings

Source: RSE 2015, I-TOWN 2015a

The **three decrees on regulations, energy certification of buildings and minimum energy performance requirements** approved on June 26 came into force on October 1, 2015 by modifying and correcting previous standards. Within the scope of the **Stability Law 2016** (L. 208/2015), various measures were introduced to reduce household costs and direct demand towards quality products, paying attention to the energy performance of buildings (ANCE 2015 b). The **Environmental Link** to the Stability Law 2016 (L. 221 of December 28, 2015, “*Environmental provisions for the promotion of green economy measures and the containment of excessive use of natural resources*”) – entered into force on February 2, 2016 – defined a series of measures including, *inter alia*, environmental impact assessment, green public procurement, provisions to promote the adoption of EMAS and Ecolabel EU systems, and minimum environmental criteria (CAMs) in public procurement.

The **new Public Procurement Code** (Legislative Decree 50/2016) makes it compulsory for any contracting party to apply CAMs, which were redefined, in the light of recent technological changes, by DM 01/11/2017 for renovations and new construction in the PA.

As far as construction is concerned, the **2017 Budget** (Law 232/2016) confirmed and extended tax benefits on housing: the ecobonus for investments in improving energy performance and the bonus for restructuring. In addition, the **sismabonus**, an important tax deduction for the adaptation of buildings to earthquake situations (both for housing and productive activities) and condominiums in seismic-risk zones, was reinforced. The Law also envisaged the use of **income from housing and building sanctions** for the purposes of protecting and re-qualifying the environment and landscape, reuse, regeneration and rehabilitation of building complexes, soil protection and mitigation of the seismic and hydro-geological risk.

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Finally, in June 2017, Legislative Decree 106/2017 on the **marketing of construction products** was issued, adapting national legislation to European provisions, stipulating that a constructor, designer, works manager, executive director or tester must comply with the obligation to use products conforming to EU Regulation 305/2011.

2.3. Regulatory framework from the point of view of Regions and Municipalities

The main measures launched by the Autonomous Regions and Provinces in terms of environmental and energy sustainability for buildings derive from national and EC regulations and vary greatly from one to another⁵. They relate to the **energy performance and efficiency of buildings**; in some areas, norms have been in force for some time, in others, no laws have been established (at most there are guidelines on sustainable construction that impose no limits), while in others there are not even levels of reference and a generic saving and thermal insulation is promoted. Also very different from one region to another is the **regulation of energy certification systems**, with substantial differences in controls and sanctions or the accreditation of certifiers and as regards the **use of renewable sources** (OISE 2015). The property market depends to a large extent on specific regional regulations to which the building in question has to refer.

Municipalities can intervene on building energy efficiency measures through Building Regulations (those which have introduced sustainability principles and norms into their building regulations number 1,182 – 14.7% of the total – 80% of which did so in the last 5/7 years) (OISE 2015). Following Law 164/2014 converting the Sblocca-Italia Decree, the **new building regulations**, valid at national level, were published in the Official Gazette no. 268 of 16/11/2016; they were jointly coordinated by the Ministry of Infrastructure and Transport (MIT), Regions, Municipalities and the Department of Public Function of the Presidency of the Council of Ministers. The Regulations are made up of a guide, an Appendix A listing the 42 standard definitions valid for all local bodies which will adopt it and an Appendix B listing 118 state norms that have an impact on construction.

⁵ The main measures of Regions and Autonomous Provinces are set out on the site http://www.itaca.org/speciale_sostenibile.asp

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2.4. Initiatives to support sustainable building

Italian legislation envisages three main **incentive schemes for energy efficiency measures**: tax deductions, the Heat Account and White Certificates (Energy Efficiency Titles, TEE) (RSE 2015). The **tax deductions** introduced by the Financial Act 2007 (Law no. 296 of 27/12/06) constitute a targeted incentive for the energy upgrading and enhancement of existing buildings. In the period 1998-2015, tax deductions for building recovery and renovation and the energy upgrading of buildings involved over 12.5 million interventions and triggered 207 billion euros of investment, of which 178 billion was for building renovation and a little less than 30 for energy upgrading (Chamber of Deputies 2015, RSE 2015). A **new Heat Account** (DM 16/02/2016) came into force on May 31, 2016, which encourages interventions to increase energy efficiency and heat generation from renewable sources of €900 million, enhancing and simplifying the support mechanism introduced previously (DM 28/12/12), of which the PA, businesses and individuals are the beneficiaries. The **White Certificate (TEE)** system differs from previous one because it is based on a complex mechanism which, for electricity and gas distributors with more than 50,000 final customers, imposes annual energy savings in final energy uses (quantified by law as TEE, where 1 TEE corresponds to 1 TOE = Ton of Oil Equivalent). This obligation can be fulfilled either by implementing energy efficiency projects which grant TEE or by purchasing these certificates from other TEE on the market (RSE 2015). On April 4, 2017, the new decree on White Certificates of the Ministry of Economic Development (DM 11/1/2017), which contains the national quantitative energy-saving goals for the years 2017 to 2020, came into force, and which includes the new guidelines for the preparation, execution and evaluation of energy-efficiency projects.

Other instruments that direct public resources for sustainable housing include the **Urban Peripheries Recovery Decree** (Presidency of the Council of Ministers, May 25, 2016), which provided for a 500 million euro call for tenders aimed at the large municipalities to refurbish urban areas suffering from economic and social marginalisation, building deterioration and lack of services. The 2017 Budget Law supplemented the fund with another €1.6 billion for the implementation of the Plans for the Relaunch of Deprived Peripheries of Large Cities (for a total state funding of €2.1 billion).

The 2016 Stability Law defined the contributions for the implementation of the **School Building Plan**, as confirmed in the 2017 Budget, with a budget of 3.9 billion by 2020 for interventions relating to the security, renovation and construction of school buildings.

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The 2016 Budget also envisaged 25 major PIS projects (Strategic Infrastructure Programme) for which the funding was defined in the “Strategies for Transport and Logistical Infrastructures” appendix to the 2016 Economic and Financial Document.

It should also be noted that following the earthquake in Central Italy in August 2016, the Presidency of the Council of Ministers launched the long-term Casa Italia programme (for a total of 25 million euros) aimed at promoting housing security against seismic risk and intervening on existing buildings to reduce their vulnerability while increasing their quality of life. The Casa Italia Plan is closely linked to the sismabonus, the application of which was made possible by the recent **Seismic Risk Classification Guidelines for Construction**, approved with Decree no. 65 of 7/3/2017 of the Ministry of Infrastructure and Transport.

Lastly, since 2017, a **fund for the financing of investments** has been set up at the MEF, which includes, among other things, the Casa Italia Programme, anti-seismic and school safety interventions, and the recovery and restructuring of public housing stock.

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3. MAJOR TRENDS IN SUSTAINABLE CONSTRUCTION FOCUSING ON GREEN BUILDING

3.1. Economic Trends

The effects of the crisis on the construction sector in Italy were severe, as shown in Table 3 on **investment in building** (net of ownership transfer costs) over the years from 2013 to 2015 and provisional for 2016.

Table 3 – Investments in Building (net of ownership transfer costs)

	2015 (€ millio n)	2013	2014	2015*	2016*	2008- 2015*
CONSTRUCTION	128,510	-7.0%	-5.2%	-1.3%	1%	-34.8%
- homes	68,042	-3.7%	-4.1%	-1.4%	-0.1%	-27.6%
- new*	21,388	-13.4%	-13.9%	-6.0%	-3.5%	-61.1%
- extraordinary maintenance*	46,654	2.9%	1.5%	0.8%	1.5%	19.4%
non-residential	60,468	-10.4%	-6.4%	-1.2%	2.2%	-41.4%
-private	35,954	-11.2%	-7.3%	-1.2%	-0.4%	-35.0%
- public	24,514	-9.3%	-5.1%	-1.3%	6.0%	-48.7%

Source: ANCE 2015b – *ANCE estimates

Between 2013 and 2015, **investments** in new residential buildings fell by more than 60% and those in non-residential by over 40%, while extraordinary maintenance saw an increase of almost 20%. In the years of the crisis, in fact, the **restoration of building assets** for static, functional and energy redevelopment contributed to containing the reduction of economic activity of the sector: in 2014, they accounted for 70% of the value of construction output (117.3 billion euros compared to a total value of output

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estimated by CRESME⁶ at 169 billion). This trend was supported by the use of incentive measures and, in particular, the effects of boosting incentives in 2013 and 2014 (OISE 2015, Chamber of Deputies 2015). The tables below show the performance in Italy of the **production index**, the **value of production** and the number of companies active in the construction sector in the period 2010-2014.

Table 4 – Annual growth rate of construction: production index (% change over the previous year)

2010	2011	2012	2013	2014
-3.6	-4.5	-13.5	-10.8	-7.0

Source: EUROSTAT 2015

Table 5 – Value of production for the construction sector (in millions of €)

2010	2011	2012	2013	2014
227,625.0	210,382.7	202,692.7	181,368.1	171,735.9

Source: EUROSTAT 2016

Table 6 – Number of companies in the construction sector 2010-2013

2010	2011	2012	2013
607,771	590,555	572,412	549,846

Source: EUROSTAT 2016

Artisan construction companies also fell by 11% between 2009 and 2015 (from 584,000 to 518,417), with a loss of more than 65,000 units (CGIA 2016, ANAEP Confartigianato 2015). Overall, the **share of the construction sector in the GDP** went from 9.5% in 2008 to just over 6.2% in 2015 (ANCE 2016), with negative employment effects (para. 1.2). Starting from the second half of 2015, there were signs of a slight economic recovery (FORMEDIL 2015) concerning, among other things, the number of employees, the reduction of bankruptcies (CERVED 2016) and the hours authorised of the redundancy fund, even though the most important indicators for construction economics remain negative or stationary (OISE 2015, ANCE 2016c). **Plant** performed better compared to traditional constructions. In 2015, the market share of plant in construction investment was 34%, with a production value of about 46 billion euros (CRESME 2016). Contrary to the overall trend, the **timber construction** market for the period 2010-2015 showed a steady growth (OISE 2015, Housing Policies 2015).

⁶ Centre for economic and social research in the building market. At <http://www.cresme.it>

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3.2. Employment trends

In line with what was described above, between 2008 and 2015, the construction sector lost about half a million direct jobs, as well as 280,000 in related sectors. Workers in 2015 account for almost 25% of industrial employees and 6.6% of those operating in all sectors of economic activity (ANCE 2015b, FORMEDIL 2015); in 2016 those employed in construction represent 5.91% of total employment (Osservatorio Costruzioni Fillea-Fdv, 2017).

Table 7 – Employment in the construction sector (in thousands)

2008	2009	2010	2011	2012	2013	2014	2015	2016
1929.4	1892.3	1863.3	1767.5	1673.7	1526.5	1458.6	1444.7	1346.0

Source: Our processing of Eurostat data 2016

Over the course of 2015, employment showed **slight signs of recovery** with territorial discontinuities, which are not able to bridge previous losses. Data on membership of the Construction Workers' Fund shows a 6.9% increase in the first eight months of 2015 compared to the same period of 2014 (ANCE 2015b), and also according to ISTAT, construction shows an increase in employment in the second quarter of 2015 (+2.3% on an annual basis) after more than four consecutive years of shrinkage. Employees in construction-related sectors are mostly involved in building, both in 2014 (72.6%) and 2015 and 2016, when they exceed 74%. Compared to the labour market as a whole, which grows by 65,000 units, the construction industry loses about 81,000 people between 2015 and 2016, thus increasing the contraction already taking place since 2014 when workers and former workers were about 246,000 more than in 2016 (Osservatorio Costruzioni Fillea-Fdv,, 2017).

If the current reduction in employment in the sector has been partially contained through **tax incentives** for building renovation and energy updating, which according to CRESME for 2011-2015 had 1,163,255 direct employees (Chamber of Deputies 2015, OISE 2015), the **forecasts** for the construction and related sector show a **still critical picture**, with a reduction in employees which is attenuated compared to the previous period but not yet finished (OISE 2015).

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3.3. Changes and innovations in the green building economy

Despite the above, construction faces a **new, highly innovative phase** (Bellicini 2016) made possible, as well as by favourable economic causes, by propulsive factors related to energy technology, the management and upgrading of existing stock, innovations in products and processes, and new technologies. Technological innovation and digitalisation are leading to **structural reconfiguration** concerning: the emergence of certain market areas in relation to the shrinking traditional ones; the evolution of traditional products, processes and models of supply; the impact of digitalisation on the construction and civil engineering sectors (FORMEDIL 2015). According to CRESME, the areas of greatest innovation concern: the best use of data and information through Building Information Modeling (BIM) and IPD (Integrated Project Delivery) tools; a greater use of prefabrication in construction sites; the integration of facility management systems in BIM models; the industrialisation of supply in response to the micro-demand for renovation (Bellicini 2016, FORMEDIL 2015). The *Observatory on Innovation and Sustainability in the Construction Industry*⁷ (OISE 2015) also refers to a **new industrial cycle for building** based on urban regeneration from the perspective of adaptation to climate change and safety. The latest report (OISE 2015) lists among the changes and innovations in the sector the **new materials, production processes** that are more attentive to the life cycle of the product, the **different organisation of work onsite** in relation to productive processes, an ever-expanding articulation of **construction chains**, the new centrality of **plant** in view of the renovation of existing property assets and **innovative techniques** for safety, retrofitting of buildings or asbestos removal. The **GreenItaly** 2016 report by UnionCamere and the Symbola Foundation reports, for example, on the spread of more than **100 network contracts between businesses** in Italy for the development of industrial chains of green building, aimed at transforming the phases of the productive process thanks to the synergy between the various operators.

Another study on sustainable building (Rugiero, Di Nunzio, Galossi 2014) identifies the areas of change in relation to forms of technological and productive innovation relating to: construction materials, the manufacture of green products; the production and use of energy from renewable sources; the management and maintenance of buildings; the quality-control process; dismantling in the cycle of the construction process; urban

⁷ Promoted since 2011 by the leading trade union federations (Fillea CGIL, Feneal UIL and Filca CISL) together with Legambiente.

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planning; the development of ESCOs (Energy service company), that provide integrated energy services.

In synthesis, ongoing trends can be described generally in five major macro-areas having to do with:

- the **paradigm of sustainable development** (interventions do not only concern energy efficiency, but also the resilience of cities to climate change, the perspective of the life cycle of products and processes, urban regeneration and quality of life and the quality of living, decent work, fighting energy poverty, and so on);
- the introduction of **elements of innovation** (mainly in products and processes), with implications for **innovative onsite management** (with a greater use of prefabrication) and the **organisation of the whole building chain**;
- the **industrialisation process of the sector**;
- **knowledge and information management** to improve processes and systems for the design, management and maintenance of buildings, with reference to the opportunities for computer modelling to support cooperation between players in the chain, worker interoperability, risk prevention and quality control;
- changes in the **demand market**, more focused on building and urban renewal, characterised by the expansion of plant and sensitive to offers such as wooden constructions.

The introduction of innovations (especially of products) in the construction industry brings **health and safety risk** management, both for workers and citizens, into a context where it is difficult to discern the distinction between new risks (associated with innovative products and technologies) and old ones (pre-existing, which increase, as in the case of the removal of asbestos). In Italy, knowledge and research on the effects of exposure to innovative products seems less rapid than their introduction (OISE 2015), with negative effects on the regulation of uses and the dissemination of information among workers. If the progressive industrialisation of construction work seems to favour the reduction of some onsite safety risks, the fact remains that safety and health issues are almost **absent in the debate** on the green economy and green building (Rugiero, Di Nunzio, Galossi 2014).

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3.4. Training needs for sustainability in building

Guidelines for sustainable construction and upgrading have profound repercussions on work activities, and this leads to the need for **new skills, knowledge and capacities** on the part of consolidated figures in the sector as well as the emergence of new profiles in some cases (FORMEDIL 2015, 2015b, OISE 2014, 2016, Rugiero 2011, 2014). On the one hand, this consideration comes up against the **inadequacy of the training system for the construction sector** (where there are 144 different profiles with an enormous range of regional differentiation) (ENEA 2015b, BUILD UP Skills 2014) and, on the other, a marked discrepancy between a widespread demand for super-specialised workers and generalised framing at the lower levels of the construction workforce registered with the construction funds (OISE 2015). In addition to the training activities carried out by the construction funds, businesses and the education and training system (which do not coincide with each other from the point of view of qualifications, certifications and recognition of skills), two projects have been established to create and update training programmes for construction workers and artisans within the framework of the *EU Intelligent Energy Europe Build Up Skills Pillar II: I-TOWN (Italian Training Qualification Workforce in Building)*, coordinated by FORMEDIL⁸, and **Bricks (Building Refurbishment with Increased Competence Knowledge and Skills)**, coordinated by ENEA. Starting from the results of a survey of the skill needs of about 1,000 employees in the sector, *I-TOWN* has formulated a proposal of contents for the training of trainers (in the classroom and onsite) on energy efficiency and sustainability, to be achieved through the construction funds and addressed at the crafts workers and technicians of the wider construction sector: construction, plant and installation⁹. The *BRICKS* project also seeks to outline the content of training trainers in five profiles: the site trainer, the thermal coating installer, the energy diagnosis manager, the energy trainer, the geothermal plant installer and the building automation installer¹⁰.

⁸ FORMEDIL is the National Training and Vocational Training Institute (<http://www.formedil.it>). The I-TOWN Project Partnership includes ANCE, ASSISTAL, RENALE (the National Network of Local Energy Agencies), SINERGIE, University of Naples Federico II – Industrial Engineering Dept., Turin Polytechnic, CNA-ECIPA.

⁹ <http://www.bus-itown.eu>.

¹⁰ <http://www.bricks.enea.it>.

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3.5. Obstacles to and drivers for sustainable building development

The **obstacles** to sustainable building development identified in the sources (analysis of the literature and workshops) are organised into **six macro-areas**: public policies; economy and finance; technology and knowledge; operational/organisational area; working conditions; social aspects. The following table lists the obstacles that were recorded.

Table 8 – Obstacles in public policies

- | |
|--|
| <ul style="list-style-type: none"> - Poor orientation of public policies in the promotion of sustainable construction and/or innovation in the sector (in particular, a lack of policies to accompany the legislative measures) - Lack of coordination of urban policies and a national strategy for the governance of cities - Lack of a national policy on the circular economy in building - Lack of direction of energy-efficiency policies in the transition - Absence of coordination and guidance of environmental and energy research - Lack of medium/long-term public planning, for rehabilitation and renovation projects and urban regeneration, which entails the risk of reducing sustainable building policies for the promotion of energy efficiency - Poor knowledge of the effects of the energy-efficiency policies implemented in recent years - Slowdown of interventions on public property, even with incentives, European funds and certifications, caused by the Stability Pact - Episodic nature of the incentives for energy efficiency and redevelopment (the Energy Efficiency Fund introduced by DL 102/2014 is not operational and the implementation methods are not generally known) - Poor utilisation of incentives for energy efficiency in the South of Italy - Limited availability of public incentives for research and innovation activities - Lack of incentives relating to credit (cost of credit for the financing of projects) - Difficulties in access to incentives by the weaker population groups and associative and collective entities such as condominiums - Delays in certification and control of interventions on the part of the PA and the Regions - Delays in payment by the PA as an obstacle to reinvestment strategies - Obstacles and administrative delays for efficiency and safety interventions - Times and costs of procedures for obtaining licences and work permits - Lack of adequate skills in the public administration - Lack of adequate training policies |
|--|

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Table 9 – Economic and financial obstacles

- Lack of demand, both public and private
- Focus on building costs (rather than on the quality of the built)
- Limited economic convenience
- High initial costs of energy redevelopment
- Cost of energy audits
- Shortage of credit opportunities for innovation
- Shortage of economic resources for building sustainability training

Table 10 – Technological and cognitive obstacles

- Failure to update knowledge on the characteristics, dynamics and working conditions in constructions
- Poor dissemination of information on good practices and innovative experiments in Italy
- Lack of adequate and recognisable tools for measuring sustainability elements
- Poor integration between profound energy updating in buildings and maintenance
- Absence of social dimension indicators in sustainable building certification models
- Unsuitability of the training offer
- Poor information and training regarding BIM

Table 11 – Operational and organisational obstacles

- Lack of structure of the entrepreneurial system in construction, which does not allow for the coordination of all players in the supply chain
- Lack of orientation to innovation in micro and small construction companies
- Difficulties of micro and small construction companies in using BIM programmes
- Fragmentation of sustainable building experiences in place
- Fragmentation of small business restructuring measures
- Difficulty for subcontractors to participate in programming (contractor dependency)
- Presence of a number of businesses and risks of interference (failure to co-ordinate)
- Dissemination of energy efficiency certification systems for buildings that reward the least effective solutions in the long term and those less suited to the climate of our country
- Lack of expertise needed to provide reliable financial forecasts (to convince investors)
- The presence of unreliable or poorly qualified construction companies and installers
- The lack of an aggregator capable of offering a “keys-in-hand package” for energy and rebuilding interventions
- Unwillingness of workers in the sector to work in teams

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Table 12 – Obstacles relating to working conditions

- | |
|--|
| <ul style="list-style-type: none">- Lack of specialised and competent personnel for the sustainable transition in construction- Presence of new and emerging risks, in addition to the traditional ones, for the health and safety of workers- More precarious and irregular work in the construction sector- Failure to recognise the qualifications issued by the Construction Schools on the part of entrepreneurs |
|--|

Table 13 – Social obstacles

- | |
|--|
| <ul style="list-style-type: none">- Low attractiveness and little real impact of sustainable building projects- Shortage of information on bio-building issues- Lack of integration among the subjects in the territory (PA, educational-training system, etc.)- Lack of information and awareness about the effects of investment in construction (energy upgrading is perceived as an extraordinary cost; uncertainty about energy savings) |
|--|

The **drivers** for sustainable building development referred to in the sources consulted include:

- The **industrialisation** process, based on the adoption of standardised and replicable solutions (greater use of prefabricated and factory-made components to be integrated in the design and construction process);
- the **introduction of innovative elements** (mainly in products and processes) into the various components of the value chain;
- the recognition of the **centrality of the quality dimension** in constructions, processes, products and workers;
- **digitalisation** (introduction of BIM and IPD), for better data use, coordination and interoperability of workers starting from the design stage and in real time during construction;
- **better utilisation of incentives** (to be stabilised over time and corrected) in the light of the very positive effects already achieved and with particular reference to the renovation of the building stock, enhancing the plant component;

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- the adoption of the **life-cycle perspective of the process**, with reference to the circular economy paradigm, for the renovation of buildings and urban regeneration;
- **training of workers** in the sector (based on the recognition of the centrality of the design phase and sensitive to the life cycle);
- the dissemination of information on positive experiences, also to promote the spread of sustainable building culture through **promotion and communication activities**;
- the **combination of restructuring measures** with those relating to safety and, more generally, the **protection of the territory**;
- the transposition of **European Directives** on energy efficiency, circular economy, urban regeneration policies and so on;
- the **financial instruments** foreseen by the 2014-2020 programme to access European structural funds, which can be used to support sustainable activities in the sector.

4. SOCIAL DIALOGUE AND SUSTAINABLE BUILDING

4.1. The industrial relations system in the construction sector

The crisis has pushed the industrial relations system to focus more on second-level bargaining than national collective bargaining (which remains the main reference point) to respond to business and territorial demands. In this framework, cooperation between the major trade unions (CGIL, CISL and UIL) has intensified and the importance of bilateral organs at sectoral or intersectoral level has increased to provide welfare and services related to wages, training, working hours, and so on (Eurofound 2016b).

The main **construction trade unions** in Italy include: Fillea (Italian Federation of Workers in Wood, Construction, Related and Mining Industries) CGIL; Feneal (National Federation of Construction and Woodworkers) UIL; Filca (Federation of Italian Construction and Related Workers) CISL; UGL Costruzioni and FESICA (Italian Trade Union Federation of Commerce and Crafts). The **employers** include: ANCE (National Association of Constructors); ANAEP (National Association of Craftsmen, Decorators, Painters and Related Activities) Confartigianato; CNA (National Confederation of Crafts and Small and Medium Enterprises); ANIEM (National Association of Building Manufacturers); FIAE (Federation of Italian Craftworkers) Casartigiani; CLAAI (Free Confederation of Italian Artisan Associations); ANCPL (National Association of Cooperatives for Production and

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Labour) Legacoop, Federlavoro and servizi-Confcooperative; AGCI (General Association of Italian Cooperatives) Production and Work; AGI (Association of Large Businesses).

There are four **contractual planks** for the construction sector, signed by Feneal UIL, Filca CISL and Fillea CGIL: industry (signed with ANCE-Confindustria); crafts (ANAEP-Confartigianato, CNA-Costruzioni, FIAE Casartigiani and CLAAI); small- and medium-sized enterprises (Confapi-ANIEM); cooperatives (ANCPL-Legacoop, Federlavoro and Servizi-Confcooperative, AGCI-Production and Labour). Each contractual plank gives rise to its own **bilateral system**, characterised by a strong territorial imprint, based on the presence of joint bodies responsible for the provision of contractual and mutual benefit services, vocational training and health and safety at work, and supplementary pensions. The signing of understandings and agreements by the social partners gives rise to the **bilateral system of constructions**, based on the unification at the organisational and functional level of the four bilateral systems and structured in three subsystems: the **system of construction funds**, joint bodies present in the territory that provide benefits and provisions established by the national collective bargaining agreement and territorial agreements signed by the business and trade union organisations in the sector, with which 150,000 companies and over 800,000 workers are registered¹¹, coordinated by the Joint National Committee for Construction Funds (Cnce), constituted by ANCE and CGIL, CISL and UIL; the **professional training system**, led by the national Formedil (building training), with regional Formedil and a network of over one hundred building schools throughout the country that accompany workers from their introduction to the site throughout their career¹²; the system for the protection of health and safety, through the **Territorial Joint Committees (Cpt)**, coordinated by the National Commission for Accident Prevention, Hygiene and the Working Environment (Cncpt).

¹¹ From the site <http://www.cassaedile.it>.

¹² For 2015, the FORMEDIL National Training Database (BDFC) has registered 42,549 courses, attended by 306,069 users, for a total of 477,175 training experiences (FORMEDIL 2015b).

COUNTRY REPORT - ITALY**4.2. Role of the social dialogue in support of the green economy and sustainable construction**

The hoped-for economic recovery in the construction sector, attentive to dignified labour, social dynamics and the environmental dimension, is found in the **paradigm of sustainable development**. From this perspective, Italy is way behind other European countries, lacking a policy and strategy for the transition to sustainable development (OISE 2014, 2015): MATTM only initiated functional consultations on the National Strategy a few months ago, as envisaged by the Environmental Link of the Stability Law of 2016¹³. In Italy too, in fact, full attention to the environment by industrial relations has matured above all over the last decade (Tomassetti 2015). In the absence of suitable places for the governance of the transition to sustainable development and urged by international organisations and the two crises, for some years the social and economic partners, local authorities, individual companies and various expressions of civil society (environmental organisations, research and development bodies, movements to safeguard public assets and active citizenship, professional orders, etc.) have assumed positions or adhered to networks and groups to meet, draft proposals that are strategic-programmatic or related to specific measures and interventions, put pressure on institutional players, and intervene in the territory. In this direction, realities have taken root such as the **Stati Generali della Green Economy** – created in 2012 to encourage the development of the green economy in Italy, promoted by the National Green Economy Council in collaboration with MATTM and MISE and co-ordinated by the Foundation for Sustainable Development¹⁴; annual meetings have been sponsored since 2011 around the **GreenItaly** report on the progress and prospects of the Italian economy and its businesses, promoted by the *Italian Union of Chambers of Commerce, Industry and Crafts (UnionCamere)* together with the *Symbola Foundation*. In 2015 and 2016, some employers' associations and trade union organisations were involved in the **Italian Coalition "2015-2015: Let's Mobilise for the Climate"** (now completed) at the **Forum for Promoting Fair and Sustainable Development** established in December 2015¹⁵ and the **Italian Alliance for Sustainable Development (ASVIS)**¹⁶ set up in March 2016 around the United Nations Global Agenda for Sustainable Development.

Several *Pacts for Sustainable Development* have been signed at local level on the basis of agreements between local authorities and social forces (such as the *Pact for the*

¹³ Law, 28/12/2015 n ° 221, G.U. 01/18/2016.

¹⁴ <http://www.fondazionevilupposostenibile.org>.

¹⁵ <http://www.mybes.it>.

¹⁶ <http://www.asvis.it>.

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Sustainable Development of the Piedmont Region of 2008) or innovative experiments in industrial relations on a territorial basis have been promoted (for example, in 2011 in Treviso with the *Pact for Sustainable Development, Employment Qualification and Competitiveness of the Local Economic System*); while in Lombardy, the Chambers of Commerce and Unioncamere Lombardia established the *Sustainable Development Network* in 2013 to disseminate instruments in support of sustainability paths in the various economic sectors¹⁷.

With regard to **sustainable construction**, special working groups have been set up in the **Stati Generali della Green Economy**¹⁸ and in the **Kyoto Club** (but this thematic group is no longer operational)¹⁹, while, in 2008, the **Green Building Council (GBC) Italia** was set up²⁰ (which, among other things, promotes the LEED certification system). Recently, the system of the **Chambers of Commerce** has developed *qualification schemes* for companies in the most representative and high-quality *Made in Italy* sectors which include sustainable construction²¹.

❖ **Initiatives at national level**

Employers' associations and trade unions, along with environmental organisations, universities and local authorities, share the view that the transition to sustainable building represents an opportunity for development and partial recovery from the crisis. A similar shared viewpoint exists between the union and a number of associations – such as Legambiente (OISE 2014, 2016) and ASVIS²² – regarding the role of social dialogue in this framework. In the following paragraphs, actions and interventions are proposed that can be traced back to the social dialogue around sustainable construction revealed, especially at local level, through consultation with the sources. These are **signals of social dialogue** in a broad sense, since the actions do not necessarily include the establishment of specific technical tables or the opening of disputes, but are *always* characterised by forms of ongoing consultation, comparison and cooperation.

¹⁷ <http://www.lom.camcom.it/?/ambiente/innovazione-e-qualita-dello-sviluppo/network-sviluppo-sostenibile>.

¹⁸ <http://www.statigenerali.org/gruppi-di-lavoro/per-un-manifesto-della-green-economy-nelledilizia-e-nellurbanistica>.

¹⁹ <http://www.kyotoclub.org>.

²⁰ <http://www.gbcialia.org>.

²¹ <http://www.dintec.it/it/pqualificarsi/qualificarsi>.

²² Concurrently with the presentation of the Association to the Chamber of Deputies in March 2016, ASVIS underlined the centrality of social dialogue in the transition to sustainability in the urban dimension.

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The activities that can be attributed to **national social dialogue** around sustainable building are not many. A first important event is represented by the signing of the **Manifesto of the Construction Stati Generali** on 14 May 2009 by Feneal UIL, Filca CISL, Fillea CGIL, ANAEPA-Confartigianato, Clai, CNA Costruzioni, Fiae Casartigiani, Aniem Confapi, Agci/Psl, Ancpl-Legacooperative, Federlavoro Servizi Confcooperative, Agi, Ascomac-Cantiermacchine, Assoimmobiliare, Federcostruzioni (ANCE, Andil, Anie, Anima, Assovetro, Federbeton, Federchimica, Federlegno-Arredo, Oice), and Finco. The Manifesto, drafted as a reaction to the first effects of the crisis, proposed to the Government, Parliament and the institutions to move in synergy around the objectives of *“renewing the territory through urban regeneration policies; an extraordinary plan of economic and popular construction; the use of the tax leverage for technological adaptation and energy saving; qualification of businesses; the traceability of financial flows to counter the Mafias; the intensification of controls on the static safety of buildings and safety at work; the extension of social security cushions; a strengthening of the DURC (certificate of NI contributions) for legality”*²³. In the years that followed, the virtuous pathways needed to achieve the proposed objectives were not followed.

A second signal of national social dialogue is represented by the activation, in 2011, of an **Observatory on Innovation and Sustainability in the Construction Industry** promoted by Fillea and Legambiente, which was later joined by Feneal and Filca as well, created to prepare an annual report on the evolution of the sector in Italy while paying attention to sustainable innovation and disseminating information on practices and interventions conducted in this area on the territory. The report reached its fourth edition in January 2016.

Further national action is represented by the signing of a **Protocol of understanding on the promotion of the culture of sustainable energy and energy efficiency for the promotion of jobs and green jobs** of March 26, 2014 by Feneal, Filca and Fillea, and the National Council and Order of Architects of Rome. The Protocol provides for the training and dissemination of energy efficiency and containment criteria for the public and private building stock and for the upgrading, regeneration, enhancement and energy efficiency of urban transformations and the static and structural upgrading of the existing building stock.

²³ Report by Walter Schiavella, Secretary General of Fillea, to the Stati Generali delle Costruzioni, May 14, 2009.

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Following the earthquakes that struck Central Italy from summer 2016 to February 2017, Fillea-Cgil and Legambiente set up the **National Observatory for quality reconstruction** to monitor the reconstruction and introduce innovations based on the principles of the circular economy, reducing the environmental impact starting from the reuse of rubble and increasing anti-seismic safety and energy efficiency through the active involvement of local populations in pilot projects. The Protocol also envisaged the adoption of a series of measures (the DURC for legality and the weekly report) in order to ensure transparency and to protect the contractual rights of workers.

Other instances of national comparison, consultation and joint evaluation of interventions, actions, measures and policies between social partners, civil society, state bodies and the PA (social dialogue in the broad sense) are represented by the **European projects** relating to sustainable construction. These include the abovementioned **I-TOWN** and **Bricks** projects (para. 3.4), the **Build Upon** project²⁴ – conducted in 2015 by Italy's Green Building Council (GBC) in parallel with another 12 GBCs, to define, in 2016 and 2017, a shared energy renewal policy for building at national level – and **Construction 21 Italy**, a platform for professionals active in sustainable building promoted by ANCE and Unioncamere of Veneto²⁵.

❖ Initiatives at local level

The types of actions and interventions **of social dialogue in the territory** (also in a broad sense) indicated by the sources include: training of workers and the qualification of businesses; knowledge management; the adoption of a structural approach to energy redevelopment; urban planning and regeneration activities; information and awareness-raising activities among the public. For each entry of this type, a few examples are shown in the following panels (this is not a mapping, but an example of what is happening locally).

²⁴ <http://buildupon.eu/it>.

²⁵ <http://www.construction21.org/italia/static/chi-siamo.html>.

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→ TRAINING OF WORKERS AND QUALIFICATION OF BUSINESSES

- **Training of young BIM managers**, also aimed at experts and surveyors, to manage the application phases onsite. Promoted in Lombardy in 2016 by Assimprendile-ANCE, Fondimpresa and Milan Polytechnic
- **Training seminars on urban regeneration and environmental sustainability** (2015) under the project *Resource. Territory. Ionian area* funded by Apulia Region and conducted by the Building School of Taranto with Bari Polytechnic, in agreement with the professional orders of architects, engineers and surveyors
- Preparation and implementation of a **training plan** to enhance knowledge and skills in the Green Building Economy related to the various stages of the construction process, to promote new ways of designing and building plant, to innovate the construction range and reduce energy consumption, within the framework of the *AGIRE Programme* of Confindustria Training Systems shared with ANCE, Fillea, Filca and Feneal, funded by Fondimpresa and implemented with FORMEDIL and the building schools

→ MANAGEMENT OF KNOWLEDGE

- The Best Department of the Milan Polytechnic recently launched **Building Smart Italia**²⁶, an association that promotes the digitalisation of the construction chain and brings together parties interested in the culture of interoperability and the interoperable use of building software (with other university departments, software companies, businesses, trade associations)
- In 2015 Tuscany Region established the **“Abitare Mediterraneo” platform for research and experimentation in eco-sustainable buildings** at the University of Florence’s technology centre, together with the University of Florence, Unioncamere, the Business Network of Mediterranean Wood, ANCE, FORMEDIL, Lucense and Legambiente

→ STRUCTURAL APPROACH TO THE ENERGY UPDATING OF BUILDINGS

- To assist local authorities in the implementation of PAES (Sustainable Energy Action Plans), the Muvita Foundation of Genoa Province, with the Chamber of Commerce and the Carige Bank and other key players, through the *Intelligent Condominiums* project has experimented with an **energy-updating instrument for condominiums** in 16 residential condominiums through ESCOs, later transferred to other municipalities in 2014

²⁶ <http://www.buildingsmartitalia.org>.

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→ URBAN PLANNING AND REGENERATION

- In 2015, Ivrea Town Council, CNA, the Order of Architects of Turin, Spi-CGIL, Banca D’Alba, Turin Polytechnic and ANACI signed a protocol of understanding and created a technical group for **experimentation in urban regeneration** to improve the performance culture of those involved in the construction process and to support the realisation of the local government PAES
- ANCE Veneto, the University of Padua, Fillea, Filca, Feneal, Unioncamere, architects, Legambiente and INU drafted the Manifesto “An Urban Regeneration Pact – Urbanmeta” and set up a group to work with a multidisciplinary and integrated approach on urban regeneration, addressing issues of land governance and soil consumption, in agreement with Veneto Region (2015)

→ INFORMATION AND RAISING PEOPLE’S AWARENESS

- In 2013, Spi-CGIL, Fillea, Auser, Sunia, Federconsumatori and other organisations provided a *Guide to Energy Consumption in Homes “Casa prima cosa”*
- Since 2012, Padua City Council, together with National Legacoop, Finabita, Tuscany Region, ER Region, Ancc-Coop, has been carrying out the *Eco-friendly Courtyards* project for the reduction of domestic energy consumption
- In June 2015, a Protocol of Understanding between businesses, trade unions and consumers was drafted in Fermo to overcome the construction crisis, revitalise the green economy and save energy by reducing the cost of household bills. To this end, a proposal was formulated for saving and energy efficiency in the construction sector aimed at the owners of 643,000 public and private buildings

❖ Interventions and actions for the social dialogue

The signals of social dialogue, the obstacles to the development of building sustainability and the sources consulted have highlighted a number of **possible actions and interventions**, divided into seven dimensions regarding public, economic, financial, technological and knowledge, operational-organisational, and social and territorial policies, as well as those related to working conditions.

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PUBLIC POLICY DIMENSION

- Defining clear and unambiguous policies to support the transition to sustainable housing
- Determining a public commitment to favour the introduction of innovation in companies in the construction chain
- Preparing a national strategy for the governance of cities based on the adoption of a wide-ranging approach aimed at programming and a new industrial cycle characterised by urban regeneration
- Adopting a change of scale for policies relating to the building stock to move from housing to urban and territorial dimensions, by treating as unitary energy efficiency and building safety, social housing and urban regeneration, the viability of private and public spaces and workers' safety
- Activating forms of coordination and guidance for environmental and energy research activities (by the Ministry of Education, University and Research – MIUR and MATTM) to promote the introduction of the necessary innovation for the transition to sustainability in the sector
- Activating a coordinated public, short- and medium-term intervention in the construction and building market both on the supply and demand side.

ECONOMIC AND FINANCIAL DIMENSION

- Defining a national plan for the allocation of supplementary public funds – compared to those available to the municipalities – for energy efficiency and the renovation of public housing, in addition to tax deductions aimed at householders
- Modulating incentives starting from the adoption of an integrated approach between energy efficiency and safety, with the possible intervention of the Cassa Depositi e Prestiti and also taking into account school and health building
- Stabilising and remodelling incentives for property upgrading, to be bound to improvements in the energy class of buildings and access to the less well-off
- Simplification of the administrative procedures needed to carry out updating interventions in condominiums through ESCOs
- Operational translation of the legislative instruments available (such as the Energy Efficiency Fund provided by DL 102/2014, for which the criteria for access by private and public bodies have to be established).

TECHNOLOGICAL AND KNOWLEDGE DIMENSION

- Defining an industrial project for the entire construction industry
- Promoting network contracts in the sustainable construction chain
- Supporting the relationships between training and research to foster the transmission of innovations from the experimental to the productive phase
- Upgrading knowledge about the characteristics, dynamics and working conditions in the construction sector

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- Disseminating information and knowledge to introduce innovation (starting from the BIM) in the various construction sectors, enhancing experimentation and virtuous practices
- Consolidating research on new health and safety risks associated with the use of chemical agents and products created with innovative materials (nanotechnologies)
- Verifying the skills needs for workers in the sector
- Extending preparatory training for all workers working onsite (including employers), at the same time as the introduction of the mandatory 16 hours for safety at work, energy-efficiency issues, sustainability in building, urban regeneration (with mutual funding mechanisms).

OPERATIONAL AND ORGANISATIONAL DIMENSION

- Simplifying and putting in place the mechanisms that make European funds (sustainable urban development) directly available for the construction sector
- Promoting and activating partnerships between public and private (PPP)
- Enhancing urban planning and the construction of popular housing in concert with the trade unions and based on a sustainable approach (through the introduction of the *eco-systemic quality* criterion), such as, for example, the “Neighbourhood Contracts” programme promoted at end of the ‘90s by the Ministry of Public Works
- Introducing certification and traceability elements for companies operating in the construction industry with trained staff, with recognised and accredited expertise
- Introducing indicators related to the social dimension in certification systems
- Introducing health and safety indicators for workers and citizens in building certification systems
- Greater effectiveness in implementing inspections by the PA
- Activating the single record book for buildings.

DIMENSION RELATING TO WORKING CONDITIONS

- Adopting an overview of the production cycle of constructions in bargaining activities, based on the centrality of the design phase
- Enhancing the participatory component of bargaining for issues related to the definition of working times and methods, professional qualifications and knowledge enhancement, autonomy and career paths (in addition to salary and continuity of employment)
- Promoting of site bargaining, in order to counter the wage dumping associated with the use of contracts other than the one for building workers onsite
- Identifying unifying and homogeneous minimum conditions for the common parts of the contracts of professional figures involved in the various phases of the construction lifecycle as well as the different first- and second-level contracts, given the new relationship between the construction and the site (overcoming the clear distinction between construction workers and labourers)

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- Formulating a national strategy for the management of workers leaving companies abandoning the construction sector (including, for example, retraining plans)
- Enhancing workplace instruments against illegal employment such as total document traceability and the DURC²⁷ for legality
- Promoting skills certification for specialist figures involved in energy-saving buildings, requesting a technical group from the Regions to define a unitary attestation system (given the high mobility of workers)
- Defining a suitable training offer (for new entrants, to adjust the skills of workers and to retrain those who are excluded), enhancing the bilateral aspect
- Introducing health and safety issues in educational actions for workers in the industry, for all qualifications and at all phases of the process (with reference, *inter alia*, to the risks and problems associated with removing asbestos from buildings)
- Consolidating new and increased risk prevention activities.

SOCIAL DIMENSION

- Extending the protocol signed by Legambiente, Fillea, Feneal and Filca to other key players
- Introducing of health and safety issues for workers and citizens in the debate on sustainable building and green economy
- Enhancing the experience of the *Coalition for the Climate* (activated in relation to the United Nations Conference on Climate COP 21 in Paris, December 2015), to open with the same methods new disputes on sustainability issues with the Government, Regions and Municipalities
- Promoting actions aimed at raising the awareness of the key players in the construction market with regard to local benefits (lower pollution, economic development, lower energy expenditure for households) driven by energy performance interventions on buildings.

TERRITORIAL DIMENSION

- Participation of the trade union in consultation and planning activities on territorial development, energy policies at regional level and disputes over redeployment and conversion of plant
- Participation of the players in social dialogue in the monitoring and control of the implementation of PAES of the municipalities that have adhered to the Mayors' Pact
- Increasing controls and sanctions by the PA on energy performance and building safety
- Simplifying administrative building procedures using the single building record (anti-seismic, energy and noise)
- Integrating territorial civil protection plans into tools for territorial development and urban policy management.

²⁷ The DURC is a document issued by the Construction Funds along with Inail and Inps which attests to the regularity of NI contributions by businesses.

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4.3. Drivers for and obstacles to social dialogue

The social partners and institutions, as well as a number of environmental organisations, share the opinion that social dialogue represents one of the tools to be used in fostering the development of the industry in the direction of sustainability. Until now it has not been possible to make the most of social dialogue for green building because of the difficulties faced by the industry in managing and contrasting the serious effects of the crisis.

The obstacles to the development of social dialogue for green building in Italy can be described in four areas, concerning: public policies; economic and work-related issues; R&D, technology and innovation; social and cultural issues. The drivers identified concern only the first three areas.

❖ *The obstacles to the development of social dialogue for green building*

In terms of **public policies**, the following obstacles were identified:

- The lack of a defined strategic position on the part of the Government on green building and sustainability with a resulting lack of relevant framework policies at national level
- The lack of a medium- and long-term perspective in planning public policies relevant to green building
- A fragmentation of responsibilities among the public authorities in the sector
- Poor coordination between national and European policies, as well as between national and local ones, on green building

The area concerning **economic and work-related issues** includes the following obstacles:

- The fragmentation and the very small dimensions of the companies in the sector
- The lack of a shared vision on green building among employers' organisations
- The limited presence of social partners in green companies in the construction industry
- White-collar workers often not being considered a target group for relevant policies
- Poor involvement in the social dialogue on green building of key actors in other sectors

As regards **R&D, technology and innovation** the obstacles identified are:

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- Poor public investment in research and innovation on the sustainable economy and green building
- Limited relationships among research institutes (universities and other organisations) and companies in the construction sector at national and local level
- Poor information and lack of training opportunities on the use of BIM

The obstacles concerning the **social and cultural dimension** include:

- Poor knowledge and information among the public about the real advantages of investments in green building.

❖ *The drivers for the development of social dialogue for green building*

On terms of **public policies**, the following drivers were identified:

- Compliance with European Directives
- The launch of new measures for securing interventions due to current and widespread hydro-geological instability and earthquake emergencies in Italy
- National policies on energy efficiency relevant to the construction sector

The area regarding **economic and work-related issues** includes the following drivers:

- The existing strong bilateral system of the construction industry, having a special role in training workers on the topic of green building
- The shared vision, strategy and formal agreements of the main sectoral national trade unions on green building
- The growing number of concrete practices of tripartite and multi-stakeholder social dialogue on green building at local level
- The tripartite national alliance initiatives fostering sustainable development
- Compliance with the legal framework on health and safety issues in the construction industry
- The growing demand for training in order to improve workers' skills and qualifications as well as the role of the OHS representatives
- The corporate social responsibility of companies in the construction industry and the implementation of branch national agreements on issues concerning green building
- Current available subsidies and European funds to be used to strengthen the role of the social partners in the framework of sustainable construction
- The European Works Councils in the construction sector

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As for **R&D, technology and innovation** the drivers for social dialogue embrace:

- The current collaboration of the national sectoral trade unions with environmental organisations for the implementation of the Observatory on Innovation and Sustainability in Green Building
- The setting up of networks/platforms/working groups to share knowledge and information on practices of innovation in the green building sector at local level, involving social partners, research and innovation institutions, environmental organisations, experts and associations of professionals and the public.

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**5. GUIDELINES FOR SOCIAL DIALOGUE IN SUSTAINABLE CONSTRUCTION
FOCUSING ON GREEN BUILDING**

5.1. Tools to strengthen social dialogue

In Italy, social dialogue on green building appears in different forms, both at national and local level, ranging from the sharing of information to consultations and negotiations, partially overlapping and in any case characterised – according to the context and different situations – by the involvement of social partners, national institutions and local authorities, universities, academies and research organisations, branch companies, experts and various professional associations, environmental and citizens' organisations. Forms of social dialogue on green building take place through various tools supporting the transition to sustainable building. These tools include, for example: the definition of formal agreements, the implementation of joint actions and practices, the setting up of trilateral networks and working groups.

5.1.1. Current tools for social dialogue on green building

AT NATIONAL LEVEL

- The signing of the **Manifesto of the Construction Stati Generali** in May 2009 on behalf of the sectoral trade unions and employers' organisations, proposing a joint action to the Government and institutions. It was signed by Feneal UIL, Filca CISL, Fillea CGIL, ANAEP-Confartigianato, Clai, CNA Costruzioni, Fiae Casartigiani, Aniem Confapi, Agci/Psl, Ancpl-Legacooperative, Federlavoro Servizi Confcooperative, Agi, Ascomac-Cantiermacchine, Assoimmobiliare, Federcostruzioni (ANCE, Andil, Anie, Anima, Assovetro, Federbeton, Federchimica, Federlegno-Arredo, Oice), and Finco
- The setting-up of an **Observatory on innovation and sustainability in the construction sector** in 2011, promoted by the sectoral trade unions (Fillea, Feneal and Filca) and the environmental organisation Legambiente, which presented its fourth update in January 2016.
- The drawing up of a **Protocol of understanding on the promotion of the culture of sustainable energy and energy efficiency for the promotion of jobs and green**

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jobs signed in March 2014 by the three main trade unions (Feneal, Filca, Fillea), and the National Council and Order of Architects of Rome.

- The establishment of the **National Observatory for Quality Reconstruction** promoted by Fillea CGIL and Legambiente in February 2017 after the earthquakes that struck Central Italy from summer 2016. The Observatory aims to monitor the reconstruction and introduce innovations based on the principles of the circular economy, reducing the environmental impact starting from the reuse of rubble and increasing anti-seismic safety and energy efficiency through the active involvement of local populations in pilot projects. The protocol contains a series of measures, such as the DURC for legality and the weekly report, to ensure transparency and to protect the contractual rights of workers.
- Recently the **Seismic Bonus** – a new fiscal incentive – was introduced, similar to the current mechanism of the Energy Bonus (*Ecobonus*). The Seismic Bonus envisages the transfer of tax credits to companies willing to restructure properties applying anti-seismic building criteria. This new tool can be used throughout Italy and not only in areas affected by earthquakes. Recently, in part thanks to the request of ANCE-Confindustria and Fillea CGIL, the transfer of the Energy Bonus directly to banks on behalf of citizens was made possible, overcoming the limitations of the fiscal deductions system that did not help those on lower incomes. Currently, the extension of these to the Seismic Bonus is being considered.
- The **European projects** on sustainable buildings involving at national level in Italy trade unions, employers' organisations, representatives of professional associations and environmental organisations, experts, universities and other relevant organisations (such as, for instance, Build Upon, BRICKS, I-TOWN, Construction 21 projects).

AT LOCAL LEVEL

- The interventions for the **energy improvement of buildings based on an intersectoral and integrated approach** (through the involvement of condominiums, financial institutions and ESCOs for the implementation of Sustainable Energy Action Plans together with local administrations; some experiences of urban planning and building of public housing grounded on the sustainability paradigm and agreed with the trade unions; etc.).

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- The launch of **round tables on urban renewal** to agree on interventions and experiments based on formal agreements and protocols involving local authorities, trade unions, employers' organisations, building companies, universities, professional associations, etc. (for example, the "Pact for urban generation – Urbanmeta" Manifesto in Veneto Region was signed in 2015 by ANCE Veneto, the University of Padua, Fillea, Filca, Feneal, Unioncamere, architects, the National Institute of Urban Planners and Legambiente).
- **The training of workers** (training of young BIM managers promoted in Lombardy by Assimprendil_ANCE, Fondimpresa and Milan Polytechnic University in 2016; interventions by the Building School of Taranto aimed at engineers, architects and surveyors on urban regeneration and environmental sustainability, promoted by the Polytechnic University of Bari and the associations of architects, engineers and surveyors).
- **Knowledge management activities** (setting up the network *Building Smart Italia*, an association supporting the digitalisation of the production chain of the construction industry, connecting key players interested in digital interoperability in the sector, set up by the Polytechnic University of Milan with software and building companies and branch employers' organizations; the "*Abitare Mediterraneo*" platform for research and experimentation in eco-sustainable buildings, promoted in 2015 by Tuscany Region with the University of Florence, Unioncamere, the network of companies in the wood supply chain, ANCE, Formedil, Legambiente).
- **Information and awareness-raising activities among the public** (the drafting of the *Guide to energy consumption in the home*, prepared by the SPI-CGIL, Fillea, Auser, Sunia, Federconsumatori and other organisations in 2013; the project *Ecological Courtyards* for the reduction of energy consumption at household level, promoted in 2012 by the Municipality of Padua with Legacoop nazionale, Finabita, Tuscany Region, Emilia Romagna Region, Ancc-Coop; the delivery of a proposal for energetic saving and efficiency to 643,000 owners of public and private buildings in 2015 in the Marche Region, implemented on the basis of an agreement involving building companies, trade unions, citizens' association and the Municipality of Fermo).

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5.1.2. Strengthening the current tools

- To make the most of the Covenant of Mayors for Climate and Energy for the implementation of SEAPs (Sustainable Energy Action Plans submitted under the 2020 Covenant) and SECAPs (Sustainable Energy and Climate Action Plans submitted under the 2030 Pact), undersigned in Italy by 3,905 municipalities out of roughly 8,000.
- To restart the previous collaboration of the three main trade unions with environmental organisations on the topics of innovation and sustainable building, extending it to professional associations and other relevant key players in the wider production chain, also in order to better disseminate information and knowledge.
- To exploit the International Framework Agreements and European Works Councils in the construction sector.
- To make the most of the bilateral bodies in the construction sector to define a training offer that satisfies the needs the requirements of the transition towards sustainability.

5.1.3. New tools

- The establishment of a permanent governmental structure for social dialogue (a committee or a working group) at national and regional level on the issues of sustainable building, involving all the stakeholders among workers and business, research and innovation, environmentalism and the general public
- The participation of trade unions in negotiation and planning activities on local development and regional energy policies, as well as in disputes on reconversion and the dismantling of industrial plant.
- The launch of alliances and partnerships between key players in the wider construction industry (local authorities, universities and academies, companies, social partners, environmental organisations, etc.).
- The establishment of working groups on behalf of trade unions federations at intersectoral level (particularly in construction and public research).

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- Making the most of pre-existing opportunities for businesses, local authorities, universities and academies, social partners, CSOs and environmental organisations to meet together (e.g. the *Solar Decathlon*), with a widening of participation in the events.
- The collection and dissemination at national level of information about **social dialogue initiatives on green building already undertaken** at local level.

5.2. Areas of action

5.2.1. Policies and legal framework

- Apply the perspective of sustainability and the circular economy at every level (national, regional, local) of the policies concerning sustainable construction through the adoption of an integrated and intersectoral approach: not only energy efficiency, industrialisation, research and development, but also safety, planning and urban regeneration (paying attention to the outskirts and metropolitan areas), urban resilience to climate change, quality of life and living.
- Strengthen the dialogue with national institutions in order to make them assume a clear position on sustainable building and promote the establishment of a space for social dialogue on the issue, within which all participants should clearly define their own role and assume their own responsibilities.
- Define a national strategy for the transition towards sustainable building which integrates the various areas (at present, the Ministry for Economic Development is preparing the new National Energy Strategy, while the Ministry for the Environment is drafting the Strategy on Energy and Climate). Responsibilities should be clearly defined and the strategy should be outlined at regional and local level as well.
- Support the national strategy for the transition towards sustainable building by establishing a multi-level governance structure led by a steering panel (which should include the Government, social partners and CSOs), responsible for the coordination of all relevant stakeholders.
- Promote the definition of a sustainable industrial project including the overall supply chain in the construction industry (building and construction materials).

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- Encourage the creation of public demand for the sustainable construction sector, beginning with interventions for the requalification of certain strategic areas (such as school buildings, areas affected by earthquakes, public housing, hospitals, etc.) and exploiting pre-existing tools such as, for example, the network of the Covenant of Mayors for Climate and Energy for the Implementation of SEAPs (Sustainable Energy Action Plans submitted as part of the 2020 Pact) and SECAPs (Sustainable Energy and Climate Action Plans submitted under the 2030 Pact).
- Encourage a process of critical review of the current mechanisms for energy certification (which are not all aligned among the Regions) involving institutions, local authorities, companies, environmental organisations, professional associations and the public. The procedures, criteria and controls should be defined within the framework of the sustainability and product life-cycle approaches, and data should be inserted in a simplified way into a single construction register (for example, the Single Record of Buildings). Furthermore, the introduction is suggested within the system of indicators used for the implementation of certification activities concerning the health and safety of workers and the general public.
- Ask for guidance in and the coordination of policies concerning sustainable building of the Member States at European level, based on dialogue and consultation among the different stakeholders (a bottom-up approach) and not only on the emission of directives (a top-down one).
- Complete the adoption of the European directives concerning sustainable building.
- Outline how to improve the incentives for energy efficiency and urban and building renewal by making them more stable in the medium and long term, paying particular attention to targets such as poorer citizens and people in public housing or condominiums. ESCOs (Energy Service Companies) should be strengthened and the credits of owners/tenants (included the less well-off) obtained thanks to energy, restructuring or anti-seismic safety measures should be transferable to banks and financial institutions (possibly through a rewards system depending on the scale of the intervention, the single housing unit, the condominium, the group of more than one condominium).

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- Sustain a sensitivity towards sustainability in housing policies, both at macro level (metropolitan areas, municipalities, regions), and at micro level (condominiums, districts, outskirts, abandoned areas to be re-used, etc.)
- Support the businesses in the construction industry not only to acquire information and access economic and financial opportunities, but also in order to build their capacities for establishing relations with the key players at local level (local authorities, research bodies, universities, financial institutions, etc.), to allow them to enter the network of the supply chain and form alliances and partnerships.
- Intervene in the regulation of the building market to ensure competition among companies in the industry is based on the quality of products and production processes and not on the reducing of costs. From the point of view of certification and environmental requirements, the introduction in the New Code for Public Tendering (Dlgs. 50/2016) of mandatory environmental and energetic efficiency criteria in any tender on behalf of all the contracting parties, is very interesting. The new code was defined as the result of consultations between Government and trade unions. In this framework an action in the tendering system would seem to be appropriate, in order to avoid the award being made based on the lowest price, ensuring the application of the National Collective Labour Contract for building more stringent and certain in comparison to other collective contracts which result in salary, training and safety dumping.
- Foster the participation of trade unions at local level in negotiation and planning activities on local development and regional energy policies, as well as in disputes on reconversion and the dismantling of industrial plants.
- Support simplified regulatory and town planning tools, rewarding projects that deal with regeneration and reconversion towards other uses of public or private assets (recovered in favour of local communities) through fast-track for assessment, control and certification.

5.2.2. Working conditions and new skills

- Adapt training in the building sector to current demand (continuous training, retraining of workers from redundant plants, secondary and tertiary education for young people) rescheduling the contents on the basis of the sustainability

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paradigm, in order to cope with the shortage of qualified workers and the need to develop new skills and profiles.

- Make the most of existing bilateral bodies in the construction sector in order to adapt and widen the training offer for workers (giving value to training already delivered by the Building Schools, also in connection to technical secondary education and the universities).
- Increase and improve the levels of public inspection on working activities on construction sites, making full use of tools such as the DURC for legality²⁸ and the weekly register of work on the site, both for safety reasons and in order to block the black economy and illegal work.
- Align the contracts of workers who belong to companies involved in different areas of the construction supply chain and operate with different professionalisms on the same work site (site contract), also in order to contrast the phenomenon of wage dumping, according to the principle of applying the contract that delivers the best treatment to workers on the work site. This principle should be twofold: a single contract for each site, selecting the one providing greater protection in terms of wages, training, health and safety.
- Pay attention to the new health and safety risks related to sustainable building activities, in light of the data provided by INAIL (National Institute for Insurance against Accidents at Work), the inadequate training offer and the very high average age of the workers of the industry.

5.2.3. Technology, knowledge and innovation of the productive process

- Establish a governmental structure for social dialogue on issues of sustainable building involving all the stakeholders from research, development and innovation organisations, the world of work, production and civil society, through the setting up of a permanent committee or working group at national and regional level.
- Increase public, basic and applied research on sustainable building and new construction materials (wood, brick, new generation cement) in order to

²⁸ The DURC is a document released by the Construction Fund together with INAIL (National Institute for Insurance against Accidents at Work) and INPS (National Social Insurance Agency) certifying the regularity of contributions by the company.

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- encourage the introduction of process and product innovation and to study the new risks to the health and safety of workers and the public caused by the use of chemical agents and products created with innovative materials (for example, through nano-technologies).
- Support process innovation and industrialisation of the sector, integrating all the players involved in the extended supply chain, including the manufacturing plants delivering products and materials.
 - Connect the interventions supporting product and process innovation and the industrialisation of companies in the supply chain of sustainable building to the paradigm of the circular economy, starting from a policy aimed at the recovery of building materials (reduction of land-fill use, recycling of components and semi-finished products).
 - Accompany the transition towards sustainable building through digitalisation, making the most of BIM tools and the industrialisation of the construction process. At the same time, pay attention to safeguarding employment levels and quality of work.
 - Facilitate the exchange of practices and information among those companies in the construction industry already sensitive to sustainability.
 - Make public the information in databanks and other centralised big data systems concerning actions on energy efficiency in the building sector in order to assess their efficacy and impact and be able to adjust existing measures and incentives, if necessary.
 - Make the most of pre-existing social-dialogue tools devoted to sharing information and managing knowledge on green building, also in order to spread information about social dialogue at local level and define the conditions for their dissemination and duration over time.
 - With this in mind, relaunch collaborative activities previously undertaken on these topics with environmental organisations, professional associations and research institutes.

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5.2.4. Cultural dimension

- Increase awareness-raising and communication activities on the subject of sustainable building (incentives and fiscal allowances, national and local programmes, certification activities, opportunities for the promotion of integrated actions in the territory, measures for energy requalification and urban renewal, etc.), providing clear and transparent information to the public, families living in a defined area/district/neighbourhood, professional associations, trade unions and companies.
- Disseminate information on good practices carried out at local level grounded in the active participation of the different parties in the enlarged social dialogue, paying particular attention to the implementation of integrated actions of sustainable building.***

5.3. Directions for social dialogue at European level

In order to strengthen European social dialogue it is necessary to adopt a multi-stakeholder approach with the involvement of the social partners, institutions, experts and civil society, also reinforcing relations between European and national levels.

In particular, workshops and interviews underline some key points to strengthen European social dialogue:

- supporting the creation of committees, observatories, forums and working groups focused on specific issues (e.g. green building and urbanisation, research and innovation, professional training, etc.);
- considering the complex value chain of the building sector, the process of industrialisation and the circular economy;
- considering the introduction of technological innovations in productive processes, in the planning and construction of buildings (e.g. BIM), in the organisation of production and labour;
- considering the existing formal and informal national networks to support the exchange of best practices of social dialogue.

European social dialogue should be directed towards a number of relevant actions:

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- defining European strategies considering economic and social specificities at national and local level, identifying priority areas of intervention considering various relevant critical points, such as: pollution, urbanisation, seismic and hydro-geological risks, etc.;
- promoting European directives to support the development of national interventions;
- promoting vocational training considering both the low- and high-skilled professions, with particular attention to the inclusion of young people and women;
- promoting training for the decision-makers and stakeholders;
- promoting the updating of professional training also taking into consideration new technologies and processes of digitalisation;
- financing green buildings and the re-qualification of old buildings with long-term strategies, also from the point of view of social housing;
- promoting a standardisation of building certification criteria with the aim of creating a common framework that is able to consider national specificities;
- financing public research and supporting the network between academia and businesses;
- supporting the creation of international academic networks;
- promoting the exchange of good practices aimed at zero-impact building interventions;
- promoting employment and organisational policies aimed at respecting the principles of decent work.

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Introduction

Poland is a medium-sized European country (about 38 million inhabitants) with a very dynamically developing construction market. Over the past several years, it has been one of the most dynamic investment markets for the construction industry, particularly in the field of road construction and infrastructure investment, which is due to the large demand for delays in the past and the new opportunities associated with the use of EU funds. Potentially a very large development market is the housing sector. In this respect social needs are very large. However, the relatively low purchasing power of potential investors and the current lack of strategic state policies in this regard is a barrier. In the sphere of green building, Poland is on one hand lagging behind the most advanced European countries, on the other hand demonstrates a high dynamics of development and introduction of green solutions in the construction industry, both in terms of new construction and revitalization of existing building resources¹.

1. The sustainable construction sector: main features

The Polish construction market is dominated by 5 out of 16 regions. Nearly 20% of the construction and assembly output is generated each year in the Mazovian region, and another one fifth is responsible for works in the regions of Małopolska and Silesia. With the addition of the regions of Wielkopolska and Lower Silesia, the total contribution to the construction industry of the five major regions exceeds 57%. Moreover, in the years

1 The report was prepared based on data from official national sources (statistics - Central Statistical Office, data - Ministry of Infrastructure and Construction, General Office of Building Control, Ministry of Education, Ministry of Labour), the data from employers' organizations, reports of non-governmental organizations, information from the interviews conducted by Trade Union Budowlani and Budowlani's own reports).

An important source of data was also information from the Voivodeship Councils for Social Dialogue and the central structures of national trade union organizations. Sustainable building statistics are updated primarily by building certification organizations and organizations focusing on sustainable building segments. Their own research is commissioned by construction companies dealing with sustainable construction, but these data are fragmentary and are mostly commercial in nature.

In general it should be stated that in Poland there are very few studies focusing on the problem of green construction. There were no separate studies on social dialogue in this area.

In the area of implementation and promotion of green construction, there are quite numerous but scattered activities of associations of companies (eg Polish Association of Ecological Building), government consultative agencies (Council of Low Emission Economy), local governments or individual large construction companies (eg SKANSKA).

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2017-2022 this share will approach 60%. The most lagging investment is the eastern region of Poland.

The Polish construction market is the seventh market of its kind in the European Union. It generates 7.4% of GDP (fluctuations from 6.5 to 8% over the past 10 years). The value of this market is PLN 115 billion (about 27 billion Euro in 2015). On the market there are about 480000 entities (with self-employed). The Polish market is atomized - 96% of companies are employing less than 9 people. Less than 200 companies are employing over 250 people, 1,300 companies - more than 49 people. Only 10-12 companies (mainly branches of international companies) are able to coordinate the implementation of large contracts. (data on 2015)

There were 5 567.600 residential buildings in Poland in 2011, including 535.100 multi-flats (CSO data, INHABITED BUILDINGS, National Census of Population and Housing 2011). Buildings in Poland in 2008 consumed 42.1% of final energy consumption. Residential buildings consume 29.9% of energy. It is important to note that the main sources of energy in single-family buildings are natural gas and coal.

In Poland (as of March 1, 2017), there are four international multi-criteria certification schemes (in alphabetical order): BREEAM, DGNB, HQE and LEED. The fifth, the latest WELL Building Standard, focusing solely on the impact of buildings on man, has the first certification on the project. At the beginning of March 2017, more than 10 million m² of usable floor space was used for all types of buildings, in all certification systems.

At the beginning of March 2017, 551 certificates were registered in all four systems in Poland.

The first environmental certificate was awarded to a Polish building in 2010. In 2016 the percentage of green buildings in Poland increased by 32%. This is a high growth rate, but it should be remembered that it is about a developing sector. The absolute majority of certificates belong to the office sector, which covers 70% of such buildings in the country. The largest number of them is in capital city of Warsaw, where there are 168 certified objects. There are as many as 189 in regional cities, which is a positive phenomenon.

249 certified buildings in Poland in 2016 were office buildings. The second place is occupied by the warehouse sector (25). New in Poland is the granting of green certificates to residential buildings - at this moment in the country we have only five such housing projects. The trend is reversed abroad, where leading certification organizations award multiple certificates for residential investment.

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In Warsaw there are as many as 47% of all certified Polish buildings, and in the Mazowieckie voivodeship, by 2016, 165 such projects were created. Cracow is ranked second with 34 certified buildings. The other cities are Poznan and Wroclaw. In both of these cities there are 22 green office buildings. An example of a proper green building policy is Szczecin, the first city in Poland that has decided to introduce a green tax relief for green projects (they need to achieve a minimum LEED level or Very Good for BREEAM).

Building certification is slowly beginning to interest the public sector. Cracow's department of buildings of the Marshal's Office of the Malopolska Region was awarded the BREEAM certificate at Excellent level.

Only in 2016 108 investments were BREEAM or LEED certified. Thus, Poland was ranked 4th among European countries in terms of number of buildings subject to environmental certification.

Green building was the most popular in the office segment. Research shows that the productivity and creativity of employees staying in office spaces with adequate access to daylight and greenery increases by up to 15%. This factor influences the decisions of large companies - office building investors and increasingly the decision of tenants of office space, which prompts developers to invest in green office buildings.

The most frequently mentioned advantage of sustainable construction is lower operating costs, but about 30% of the surveyed Polish companies also indicate the quality of the building confirmed by the certificate, tenant education and the higher value of the building at the time of sale.

According to World Green Building Trends 2016 Developing Markets Accelerate Global Green Growth report: Dodge Data & Analytics, the reduction of electricity consumption is still the most important reason for the construction of green buildings in Poland. Second is the saving of resources and the reduction of water consumption. Of course, these benefits can also be attributed to "ecological" housing estates, which are growing in Poland.

According to the report mentioned above, in Poland 19% of construction companies declared that over 60% of their projects are 'green' ones. This phenomenon is expected to increase in 2018 by 29%.

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■ *In Poland, the growth of green involvement is more measured, with only a 10 percentage point gain expected in the percentage of those doing more than 60% of their projects green, and limited growth among those doing less green work. The decline in those doing little to no green, however, is still quite substantial, from 31% to 18%.*

■ *Poland: One sector dominates the responses from Poland: 50% select new commercial construction as a sector in which they intend to build green in the next*

three years. Commercial interiors, at 27%, is a distant second, but it is still a bit higher than the 20% globally that expect to do work in this sector, demonstrating the importance of the commercial market for driving future green work in Poland. On the other hand, Poland has the lowest percentage of respondents from any of the countries included in the study who expect to be doing new green institutional construction. This reveals the need for greater green engagement by the major institutions and government in Poland.

From:(World Green Building Trends 2016 Developing Markets Accelerate Global Green Growth: Dodge Data & Analytics report)

According to this report, despite the high dynamics of sustainable construction, Poland is one of the European countries with a very low public awareness of the benefits of green building. Ecological solutions are still used in our country only sporadically, and regulations facilitating 'green' investments are not being implemented at the right pace. Still, the basic instrument for supporting sustainable building investment is the 2008 Law on the Promotion of Thermomodernisation. This is a very useful policy tool, but insufficient.

According to the Act of 21 November 2008 on the Promotion of Thermomodernisation and repairs, thermo-modernisation projects include:

- improvements that result in a reduction in the annual energy requirement for heating and DHW heating by 10 to 25%, depending on the type of refurbishment and previous improvements
- improvements that will reduce annual primary energy losses by at least 25% in the local heat source and local heating network

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- reducing the cost of purchasing the heat delivered to the facility by at least 20% per annum thanks to the technical connection to the centralized heat source and the elimination of the local heat source
- conversion of conventional sources of energy to renewable unconventional sources or use of high-efficiency cogeneration.

The above-mentioned points are determined by the most frequently occurring areas of green investments in existing housing stock in Poland.

2. NATIONAL POLITICAL FRAMEWORK FOR SUSTAINABLE CONSTRUCTION

2.1. National Policies

Poland formally adopted, but with delay, all the regulations of the European Union regarding energy efficiency. Improving the energy efficiency of buildings is gradual but slow. The Polish government, however, assumes that the objectives of the EU in terms of reducing energy consumption and emissions reduce by 2020 will be achieved.

2.2. Main regulations at national level

In Poland legal regulations concerning buildings are contained in the Construction law (Act of July 7, 1994 concerning Construction Law) as well as in the Spatial Development Act (Act of March 27, 2003 on Spatial Planning and Development). A very important piece of legislation is the Regulation of the Minister of Infrastructure of 12 April 2002. on the technical conditions to be met by buildings and their location (Journal of Laws, 2002, No. 75, item 690). In the near future (in 2017) the Urban and Construction Code will be adopted, including construction and land use planning as well as the new Regulation on technical conditions to be met by buildings and their location.

Very important for the implementation of sustainable construction is the Polish Public Procurement Law, adjusted in 2016 to 2014 EU directives.

In addition to the Public Procurement Law, which is to be seen as a procedural law that provides the contracting authorities with first and foremost the appropriate instruments to enable them to purchase goods, services or works, there are other acts of domestic law connected with PPL. Among them is the Energy Regulation Act of May 20, 2016 (Journal of Laws, 2016, item 831), which obliges public authorities to:

- acquisition of energy-efficient products or

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- purchasing or renting energy efficient buildings or parts thereof that meet at least the minimum energy savings and thermal insulation requirements as laid down in the technical specifications for buildings and their location, or
- ensure that the recommendations contained in the energy performance certificate in the buildings owned by the Treasury undergoing reconstruction are complied with, or
- Implement other energy efficiency improvement measures for the energy performance of buildings.

In addition, when awarding a public service contract, public authorities should oblige the service contractor to use the products fulfilling the aforementioned conditions. Requirements if new products are purchased for the purpose of this service. Energy efficiency obligations imposed on public authorities and designated standards of purchased products apply to supply contracts, services or works with a contract value equal to or above the EU thresholds specified in the directives coordinating the award of public contracts.

The most important regulations in the field of construction are contained in the Construction Law. The implementing act for the Construction Law is the Ordinance of the Minister of Infrastructure of 12 April 2002 on the technical conditions to be met by buildings and their location (Journal of Laws, 2002, No. 75 pos. 690)

The Regulation on the technical conditions to be met by buildings and their location governs in detail the energy efficiency of buildings that are designed or built or rebuilt. The changes to the regulation introduced a gradual increase in the level of requirements up to 2021. These phase changes will, inter alia, allow for a smooth adjustment of the construction market to the legal requirements in force. The Regulation is currently being adapted to a parallel, comprehensive legislative act that will be the Urban and Building Code. However, significant changes are not anticipated in terms of energy efficiency regulations.

Important for the building design phase is the Regulation of the Minister of Transport, Construction and Maritime Economy of April 25, 2012 on the detailed scope and form of the construction project (Journal of Laws, 2012, pos. 462).

The changes introduced in this implementing act extend the obligation to analyze the feasibility of rational use of highly effective alternative systems for all buildings and change the scope of analysis. The aim is to popularize the use of alternatives (including

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decentralized energy supply systems based on renewable energy, cogeneration, district heating or cooling, or block, in particular when fully or partially based on renewable energy and heat pumps) where it has economic, technical and environmental justification.

Minimum requirements include:

- providing an EP value [kWh / (m²)], defining the annual computational need for non-renewable primary energy for heating, ventilation, cooling and hot water preparation and built-in illumination (in the case of public buildings, collective housing, and manufacturing plants), all calculated according to the methodology for calculating the energy performance of buildings, is lower than the limits set by the Regulation,
- The building's partitions and technical equipment should meet at least the thermal insulation requirements specified in the Regulation. Minimum requirements are deemed to be met for a building subject to rebuilding if the partitions and technical equipment of the converted building correspond to at least the thermal insulation requirements set out in the Regulation.

The basic document defining the energy parameters of the building is the Energy Performance Certificate

This document specifies the amount of energy required to meet the needs of the building (or part of it) for heating and ventilation, hot water preparation, cooling, and (for non-residential buildings) also lighting. The obligation to have certain energy performance certificates for a building or part of a building in certain situations is a result of European law. The purpose of introducing certification is to promote energy efficient buildings and raise public awareness about the potential for energy savings in buildings. With the information provided in the certificate, the owner, tenant or user can determine the indicative annual energy demand and hence the cost of living associated with the energy demand.

The energy performance certificate must be handed over to the buyer or tenant when the building, part of the building or premises is sold or rented.

The designer fulfills the minimum requirements for the building at the stage of the architectural and building project and then the construction manager at the stage of the project. Both the designer and the construction manager are obliged to take into account technical and building regulations when designing and building. The amended provisions

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shall always apply to newly erected buildings and, in the case of existing buildings, where they are subject, inter alia, to reconstruction.

The obligation to draw up the certificates, however, is limited. The provisions of the Energy Performance of Buildings Act do not provide for the obligation to draw up energy performance certificates when the building is put into use when the building is erected by the owner himself "for his own use".

Currently, the following rules govern the energy performance of buildings:

- The Act of August 29, 2014 on the Energy Performance of Buildings
- Regulation of the Minister of Infrastructure and Development of February 27, 2015 on the methodology for determining the energy performance of a building or part of a building and energy performance certificates
- Regulation of the Minister of Infrastructure and Development of February 17, 2015 regarding the method of and the detailed scope of verification of energy performance certificates and protocols of inspection of a heating or air conditioning system
- Regulation of the Minister of Infrastructure and Development of February 17, 2015 on the model of protocols of control of the heating system or air conditioning system

These provisions include, in principle, the overall issue of energy efficiency on buildings. It means that there is no problem in the cohesion of the national and EU regulations.

2.3. Initiatives Promoting a sustainable building and energy efficiency

Poland has a national plan aimed at increasing the number of buildings with low energy consumption. It was promulgated in the Resolution No. 91 of the Council of Ministers of June 22, 2015 on the adoption of the 'National Plan aimed at increasing the number of buildings with low energy consumption'. The resolution came into force on July 17, 2015.

At the same time there are projects aimed at certification of buildings (promoted mainly by large construction companies and the largest developers and numerous associations dealing with environmental protection, reduction of greenhouse gases and energy efficiency. There are mainly BREEAM and LEED certificates (437 certificates till 2016)

The most common form of reduction of energy losses in existing buildings is the program funding thermal insulation implemented and support for many years by the state (loans

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of Bank Gospodarstwa Krajowego) - thermal insulation of buildings consisting of writing off part of the loan. This program is used in multi-family housing.

In promoting energy efficiency and environmentally friendly technologies, the actions of manufacturers of construction materials and products, including cement, roofing, building ceramics, and windows, are important. Key Polish companies in this field maintain the highest European standards.

3. MAIN TRENDS OF GREEN BUILDING ECONOMY

3.1 Economic trends

Legal regulations are inadequately supported in funding initiatives in the area of green building. However, investments in energy-efficient construction and environmentally friendly building activity are still more expensive than traditional construction investment, the new programs are being slowly implemented. It should be noted, however, that majority of new construction projects (especially in housing) are implemented within the new standards, but with little regard for their further development. A large positive impact on the development of green building and improving the standards of existing buildings can have a reaction to the government and local authorities in major cities to increase smog pollution (originating mainly from building heating coal fuel of low quality). Decisions are made on raising standards and the introduction of penalties for emissions.

3.2. Occupational trends

In the Polish construction industry 840000 persons operate (employers, self-employed and employees) including 413000 employed under a contract of employment (GUS 2015). With a low level of unemployment in the country of 8.7% (2016) the chronic shortage of qualified specialists is common. The reason is the instability of employment and much higher salaries in other EU countries. As a result, constantly abroad in the EU countries is approx. 200000 construction specialists. The gap is partially filled by about 25000 migrants employed under an employment contract and 260000 (GUS 2016) migrants working temporarily in the Polish construction industry - 98% from Ukraine.

Formal education in the construction industry, both at the level of skilled workers, technicians and engineers, takes into account ecological and environmental aspects of the curricula (core curriculum implemented in 2012). However, this has a limited impact on the labour market, because only a small group of employees (except engineers) are

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gaining competences in the formal system. Non-formal education and prior-learning in the workplace do not take into account the issues of green building as much as formal education does.

3.3 Drivers a barriers for the green building

Within the framework of favourable trends in the development of green building in Poland, in addition to European trends, it is also possible to identify those that are specific to Poland, including, above all, a broad social campaign led by regional authorities aimed at counteracting smog in cities. The main barrier to the development of green building is: low social awareness and the belief that pro-ecological investments are expensive, lack of funds for proper investments and support of Poland's dominant power supply system on coal supplies.

DRIVERS FOR GREEN BUILDING

- **Compliance with European law (with delays)**

Poland has formally implemented all European Union regulations on sustainable construction. Although this implementation has been delayed, parliamentary legal acts are now being introduced at the level of implementing legislation, which should support green construction in the coming years. It is important that the new legislation also includes sanctions for investors and building users who do not comply with the adopted standards and standards.

Good examples of such government policies are:

- Ordinance of the Minister of Development and Finance of 1 August 2017 on the requirements for solid fuel boilers. Dz.U. 2017 pos. 1690. Date of entry into force: 01-10-2017
- Ordinance of the Minister of Energy of 18 May 2017 on the detailed scope of the obligation and technical conditions for the purchase of heat from renewable energy sources and the conditions of connection of the installation to the grid Dz.U. 2017 pos. 1084 Entry into force: 20-06-2017

- **New measures, requirements and national policies (building code and new public procurement law) and positive regional policies**

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Regulations promoting sustainable construction are included in all the newly proposed building regulations. The building and urban code, which will be introduced in 2018, will be of key importance as well as the new law of public procurement, in which environmental issues will be addressed in the terms of the contract.

- **“Green fashion” factor in residential building sector**

Fashion for green building is important for the development of this sector. In addition to the economic and social benefits of investors holding funds for green building investments, this is a very important factor influencing investment decisions. This applies to both office buildings, individual residential construction and construction investments in rental housing.

- **Positive involvement of big construction companies**

Promoters of green building in Poland are mainly large international construction companies. They started to promote building certification in Poland and they were the first to implement ecological solutions. Large companies also have appropriately qualified staff for green construction and train employees (also subcontractors) in this area.

BARRIERS FOR GREEN BUILDING

- **Coal based energy sector**

Regardless of the introduction of new green building technologies, it is important to remember that energy suppliers in Poland use primarily coal-based sources. Alternative energy sources are still poorly available. Many households in Poland still gain energy from their own sources, based on coal combustion. Changing these energy sources is costly.

- **Atomized structure of the sector**

The fragmentation of the sector is a barrier to the implementation of pro-ecological solutions and new technologies in construction companies themselves. Dominant small and micro-size construction companies, with low profitability, do not have the means to invest in environmentally-friendly technologies and most often use cheaper, non-ecological building materials.

- **Lack of capital sources and limited economic incentives**

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A survey shows that lack of access to financial resources (loans for green building) is one of the major barriers to the development of this sector. The same research shows that there is a lack of economic incentives to invest in green building. Tax policy is not conducive to this either.

- **Qualification and competences gap**

Most technical universities in the field of construction have already introduced education for green building. While the engineering staff is well educated, the 3 -4 EQF education and training in this area is still insufficient. Vocational formal education is at a high level and employs adequate programs, but in non-formal education, green construction is often absent. Also present is a poor system of training older workers in new competences.

- **Lack of client education – low level of awareness**

All research indicates low ecological awareness of Polish society. At the same time it is estimated that environmental education (including green building education) is insufficient. Attention is drawn to the need to develop primary education (primary schools).

- **Another barriers**

The barriers blocking the development of commercial energy efficient buildings in Poland include the absence of market data on media consumption in commercial energy efficient buildings and in buildings certified in LEED or BREEAM systems, lack of legal regulations supporting the development of commercial energy efficient buildings and unreliable energy certification public system.

Another important barrier to realizing the concept of eco-development is the low effectiveness of environmental law in Poland. It is adapted to EU requirements but not enforced. A major brake in this market for 41 % of responders is the lack of knowledge and adequate support from the central administration or local governments. (Dodge report 2016). Experts say Poland cannot afford to implement the EU directive. The costs of adapting public buildings may be higher than the penalties that Poland would have paid if it had not been implemented.

According to the Go4Energy report "Prospects for the development of energy-efficient buildings in Poland", as much as 85% of the respondents misjudge the government's efforts to prepare the economy for change. Most respondents also point to the low

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availability of funding tools and the lack of effective incentive schemes as the most important obstacles to the development of the green building sector in the country.

4. SOCIAL DIALOGUE AND GREEN BUILDING

In Poland, the social dialogue has not reached a high level of efficiency, mainly due to insufficient representation of employers' organizations, the weakening role of trade unions, and unfavourable dialogue policies of the government. Tripartite dialogue policies bring some effects. Bilateral dialogue exists, but because of a lack of legal instruments has little effect on industrial relations and the labour market. Collective agreements exist basically only at the level of large enterprises and the public sector and their number is decreasing. The Council for Social Dialogue operates at the national level, and Voivodeship Councils for Social Dialogue operate at the local level. The key sectors all have Sectoral Tripartite Commissions involving the government structures, trade unions and employers.

4.1. Industrial relations system in the construction industry

Collective agreements apply to a very small number of companies within the construction sector (approx. 40). Sectoral collective agreements do not exist. Some larger industry associations of employers (2) are not affiliated with the national employers' organizations and are not representative for the whole sector (small businesses do not associate). Two national trade unions (Budowlani and Solidarność) are members of two national forums - although there are formal and informal cooperation agreements between employers' organizations and trade unions. The main formal forum for dialogue in the construction industry is the Tripartite Commission. There are also formal structures of dialogue in the field of health and safety in construction.

4.2. Social partners, green economy and sustainable development

Social partners at the national level focus on environmental issues in the economy and sustainable development to a limited extent. The activity of social partners is limited to giving opinions on draft laws submitted by the government - there are few social partners' own initiatives.

Social partners at regional level are of greater importance for sustainable construction. Between 2015 and 2016, in 11 out of 16 voivodeships tripartite agreements were signed for an integrated regional development policy. Such agreements were signed by the voivodeship (regional government) authorities and representatives of regional

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employers and trade unions' organizations. Most of these agreements contain provisions for sustainable construction development plans in the region. One of the better examples in this area is the AGREEMENT FOR AN INTEGRATED SILESIA VOIVODESHIP DEVELOPMENT POLICY concluded in 2016, envisaging the development of low-carbon construction (both residential and industrial) and the revitalization of post-industrial areas. The Silesian region is the most industrialized region in Poland with a significant share of heavy industry - primarily coal mining. Old urban buildings dominate it. New investments, both residential and industrial, are being built in the area of old, shut-down industrial facilities. Most significant revitalization initiatives and actions for sustainable construction are taking place in the Silesian region.

4.3. Social dialogue and sustainable construction and buildings

Slightly better activity of social partners can be noticed at the sector level. It is practised primarily in joint initiatives in national and international projects in the sphere of professional education for sustainable building (Leonardo da Vinci and Erasmus+ projects). Especially important is the current initiative of the Sectoral Council of Competences in the Construction Industry (implemented from 2017). The "Budowlani" trade union is leading the organisation effort of the project, co-financed in the first phase (2017-2022) by the European Social Fund. This council will, among other things, focus on new qualification requirements for green building, new specialties and building techniques as well as the involvement of employers in vocational education and training. Another initiative is a joint development of Sectoral Qualifications Framework prepared jointly by employers' organizations, the Budowlani trade union, and scientific institutions – a framework which includes qualifications for sustainable construction.

The "Budowlani" trade union is one of the few trade union organizations dealing with sustainable building issues from the point of view of employee interests. Although this issue does not appear at the level of corporate social dialogue, national union structures have repeatedly called on government institutions to take into account the needs of the labor market in sustainable building. Energy saving measures in the construction process and especially maintenance of buildings generate new demands within the labor market and require new qualifications. It involves not only the training of new employees with the necessary qualifications but also the possibility of employing workers who may lose their jobs. This applies especially to older workers who are no longer able to carry out construction work (especially at high altitudes) but their qualifications are high. The union has been calling since 2014 to train and use these skilled workers to conduct energy audits in existing buildings. This applies above all to employees at level 3 and 4 EQF (technicians

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and skilled workers). At the same time, the trade union participates in works on the Sectoral Qualification Framework in the construction industry and works towards systemic introduction of vocational training in the knowledge and skills field for eco-friendly and energy-efficient construction as well as the management of construction waste. In the new training curricula adopted in 2012 as well as the new qualification standards, such mandatory records have been found.

4.4 Frameworks for social dialogue

The problem of sustainable construction and professional qualifications, the labour market and new technologies is also a part of the Tripartite Committee for Construction and Municipal Economy's activities. Due to the commitment to the work of the Committee of the Ministry of Infrastructure and Construction and four other key ministries for the construction sector this forum is and will be in the near future the main platform for social dialogue.

Another important platform for dialogue is the Sectoral Council of Competences in the construction industry. The Council represents all major employers' organizations, trade unions, chambers of commerce and occupations in the construction industry. In the Council are also representatives of vocational schools and universities and research institutes in the construction industry. The Ministry of Infrastructure and Construction has its representatives in the Council. One of the Council's tasks is to monitor the sector in terms of new qualifications needed for sustainable construction. "Budowlani" is the leader of the partnership managing the Council. The representative of the Union is the Vice-President of the Sector Council on Building Competence.

The forthcoming Council actions provide for identifying the qualifications that will be most needed in the Polish construction industry, taking into account legislative developments on sustainable construction, energy efficiency, new waste management procedures and asbestos removal.

Although the structure of the tripartite social dialogue in Poland is weak, it can be said that the regional structures of social dialogue (Voivodeship Council for Social Dialogue and Regional Labor Market Councils) play a positive role in the dialogue for sustainable construction.

It is the Voivodeship Council for Social Dialogue that is a body in which regional social partners have concluded agreements on the sustainable development of the regions.

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4.5 Drivers and barriers for the social dialogue

DRIVERS FOR GREEN SOCIAL DIALOGUE

- **Well-developed tripartite system of dialogue**

The structure of social dialogue institutions in Poland is well developed, both at central and regional levels. This structure is sufficient for a social dialogue on sustainable construction. In the construction industry there is a Tripartite Council on Building and Urban Management, which represents all the major organizations of social sector partners and the major chambers and professional associations of the construction industry.

- **Active social partners and administrative structures on the regional level**

At the regional level, representatives of social partners in construction are active in the Regional Councils for Social Dialogue and have the potential to influence regional green building policies.

- **Active trade unions focused on employment policies (new possibilities)**

Some trade unions - including the unions of construction workers - have already engaged in shaping employment policies in the green building sector. This is mainly used by the Sector Council on Competences in Construction Industry. The "Budowlani" Trade Union plays a key role in this Council.

- **Big employers oriented on co-operation and dialogue**

Green building is conducive to the involvement of the largest construction companies, which have a decisive role in managing large construction investments in Poland. These companies also have a decisive influence on the activities of employers' associations. Large companies are also undertaking joint initiatives to promote sustainable construction sector.

BARRIERS FOR GREEN SOCIAL DIALOGUE

- **Low level of awareness – both sides (employers and local unions)**

The awareness of green building needs in smaller construction companies and their trade unions is still low. Both employers and partners at this level still do not see the benefits

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of investing in green technologies in companies and appropriate training systems for employees.

- **Lack off collective agreements in the industry and ,binding tools'**

In Polish construction the number of collective agreements is small and still decreasing. There is no sectoral collective agreement. There are no other agreements that would address the issues of green building in autonomic dialogue.

- **Lack of representative partners on a national and regional level**

The weakness and under-representation of social partners in Polish construction is a serious barrier. There are no representative employers organizations in the sector. The scope of impact of trade unions is also limited.

- **Absence of social dialogue in small and micro companies**

Employers in small and micro construction companies in Poland are generally non-affiliated. The law on trade unions hinders and often makes it impossible to associate workers from micro-companies in trade unions.

- **Limited access to financial sources (all parties)**

Both sides of the social dialogue do not have the means to introduce and promote effective tools for green building. At the same time, the access of both employers' organizations and trade unions to public funds (including EU funds) is limited and difficult.

5. GUIDELINES FOR SOCIAL DIALOGUE IN SUSTAINABLE CONSTRUCTION

5.1. Tools to strengthen the social dialogue on the green building

NATIONAL AND REGIONAL POLICIES SUPPORTING 'GREEN' INVESTMENTS

Poland is a country with a central management structure, therefore green building regulations are created at the parliamentary level and executive acts at ministerial level. Local self-governments, however, play important role in this area, and they are deciding to implement public policies and investments in their area because they have local funds (from taxes). Since most public investment in green building, is local, especially in relation to old building stock, local governments decide on distribution of their own resources and frequently application for European Union funds. The most

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important level is the level of the municipality, because it has the majority of resources collected from local taxes.

The basic strategy legal acts on green building do not contain mechanisms to promote social dialogue in this area.

Such a document is Resolution No. 91 of the Council of Ministers of 22 June 2015 on the adoption of the "National plan to increase the number of buildings with low energy consumption." The resolution entered into force on 17 July 2015.

Similarly, the Act of 29 August 2014 on the energy performance of buildings with the most potential impact on green building policy does not contain mechanisms to promote dialogue in this area.

A useful tool to support the policy of renovation existing buildings is the Act of 9 October 2015 on revitalization, taking into account the needs of energy efficiency,.

The Act on revitalization also provides for two special solutions facilitating revitalization in the municipality. They will not be mandatory - they can be used depending on the needs and characteristics of the planned activities.

They are:

- creation of special revitalization zones (SSRs) in revitalized areas. The SSR will allow for the use of special facilities (eg. the possibility of awarding building renovation grants) and simplifying the administrative procedures for Local Revitalization Plan implementation;
- Local revitalization plan (special form of local spatial development plan), which will be the basis for implementation of urban transformation and construction works included in the Local Plan. The regulations that characterize this special form of a local plan are, for example, the possibility of concluding in the local plan the concept of urban planning or assigning to the real estate detailed conditions for the implementation of the investments envisaged in the plan;

There are mechanisms in the Revitalization Act to ensure social and civic dialogue connected with consultations on solutions and programs adopted at the municipality level. The provisions of the law make it possible for organized groups of citizens and

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social partners organizations to undertake initiatives aimed at revitalizing existing resources, particularly in the area of energy efficiency of residential buildings. Consultations have a decisive influence on the distribution of funds for investment.

SOCIAL PARTNERS INVOLVEMENT AND FORMAL CO-OPERATION

At the national level, the social partners participate in the 'green' dialogue in the Social Dialogue Council and by participating in committees monitoring the distribution of EU funds and various working groups.

Employers' organizations and trade unions give opinions on draft laws and the most important executive acts.

In the construction sector there is a Tripartite Council for Construction and Municipal Economy, which also deals with the issue of green building, including especially energy efficiency tasks. In this Council the trade unions are strongly represented.

The dialogue on investment in green building, both new investments and revitalizing existing buildings, is being conducted at the voivodship (regional) level in the formulation of the Regional Development Plans as well as at community level in the development of Community Revitalization Plans. In the first case, employers' organizations and trade unions take part in the activity of Voivodship (Regional) Councils for Social Dialogue. In the second case, the dialogue is 'civil' in nature - without the involvement of the social partners. The exceptions are large municipalities, where operate permanent commissions for revitalization and energy savings of new public investments. In several of these committees, there are social partners represented. An example is the Committee on Social Dialogue on Architecture and Spatial Planning in Warsaw.

CIVIL SOCIETY BODIES AND CO-OPERATION WITH OTHER BUILDING SECTOR ORGANIZATIONS

About 800 ecological organizations operate in Poland. More than a dozen of them are engaged in green building. The most important social organization supporting green building is the Polish Association of Ecological Building, established in 2008. The real problem is the fragmentation of civil society organizations dealing with the problems of green building and their poor co-operation with employers' organizations and trade unions working in the construction industry. Social partners in the area of green building usually take their own initiative, without cooperating with organizations of the civil society.

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ROLE OF EDUCATION AND SCIENTIFIC SECTOR

Polish universities and research institutions are involved in the promotion of green building. Virtually all building engineer education programs contain components related to sustainable construction. All major technical universities and colleges offer postgraduate studies in sustainable construction and revitalization of existing resources. In vocational schools, the core curriculum of education in the construction professions is introduced, taking into account the issues of energy efficiency and ecology in the construction industry.

Poland has high standards of energy efficiency for manufactured building materials. As one of the largest European manufacturers, Poland introduces the highest standards of energy efficiency for windows and doors. The Institute of Building Technology is responsible for the implementation and observance of the standards.

A serious problem in education and training for green construction, however, is the implementation of appropriate programs for non-formal education.

5.2. Areas of action

NATIONAL LEVEL

In spite of the formal possibilities, the social partners at national level have been so far not very active in the area of pro-ecological policy and sustainable construction. Actions not only require the change of existing institutional structures of dialogue, but also the development of trade unions' strategies for action, particularly at the level of the Council for Social Dialogue, and need real involvement in committees monitoring the implementation of public programs and the spending of EU funds in this regard.

The involvement of the social partners at the sector level is more significant. The Tripartite Council for Construction and Municipal Economy recognizes the need to promote green building understood much broader than the efforts aimed at increasing the energy efficiency of new buildings and revitalizing old ones. Particularly very promising are the efforts to change the approach to non-formal education of construction workers.

Within the sector, employers' organizations, trade unions, chambers of commerce and professional associations should strive to sign an agreement with the government administration for the promotion of sustainable construction. It is also important to involve trade unions in the promotion of sustainable construction in the solutions

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planned in the new Building Code and the executive acts in the Code, as well as in the new law on public procurement.

REGIONAL LEVEL

At the regional level, the model of continued involvement of the social partners in the green building sector should be developed. One should strive for the dissemination of the model adopted in the Silesian Voivodship, where the social partners have become signatories of the Regional Development Strategy and have obtained formal monitoring of its implementation. Trade unions of construction workers in all regions should join the working committees established by the Voivodship Council for Social Dialogue dealing with vocational training and environmental issues.

LOCAL - COMPANY LEVEL

In Poland, at community level, there are basically no social dialogue structures. Consultations are conducted in the framework of civil dialogue. Due to their structure, trade unions have the opportunity to engage in dialogue only at the level of large cities.

On the other hand, trade unions have the opportunity to participate in shaping the policy of green building in large construction companies. These companies are the most important promoters of green building in Poland in the private sector. The task of trade unions is to draw attention to these aspects of 'green' labor market issues as new skills, the use and retraining of older workers, facilitating training at the workplace.

EDUCATION AND TRAINING

In this area the social partners have a special role to play. The Trade Union Budowlani has been the leading organization in the Sectoral Council of Competences in the Construction Industry. The Council will sign an agreement with the Minister of Infrastructure and Construction, including the promotion of green building in vocational education. This gives a chance to coordinate activities, given the fact that all

major employers' organizations, building chambers, mayor technical universities, vocational schools, research institutions and certification bodies are active in the Council. The issue of education for green construction is already being dealt with by three working groups of the Council. It is important to involve small and medium enterprises in this process. The Council currently has funds for such activities within the framework of the project until August 2022.

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The Sectoral Framework for Building Qualifications will be a good tool for implementation and will become part of the Integrated Qualification System in Poland upon the request of the Council and decision of the Minister of Infrastructure and Construction.

EUROPEAN PROJECTS

Social partners have been implementing European projects dealing with sustainable development and sustainable construction for years. The Trade Union Budowlani has implemented such projects in the past (DETIC Leonardo da Vinci - training for thermos-modernization, CertiVET - Erasmus + - VET trainer in the construction industry education model, ECO4VET Leonardo da Vinci - training for green design in the furniture industry) and now (BROAD, VET4LEC). There is a need of creation platforms to disseminate the results of these projects after their completion.

MULTILATERAL COOPERATION WITHIN THE SECTOR

The challenge for the social partners is to coordinate the diffusion of green building initiatives. This should be supported by agreements on permanent cooperation with civil society organizations and OSH organizations. Such cooperation can be based on the existing agreements on the cooperation of the Trade Union Budowlani with the All-Polish Employees' Union of Occupational Safety and Health Services and the Agreement on Occupational Safety in Construction concluded by the largest construction companies operating in Poland.

COLLECTIVE AGREEMENTS AND OTHER BINDING AGREEMENTS WITH EMPLOYERS

It is necessary to take into account the issue of green building (especially in the field of vocational training and construction of wage tariffs) in collective agreements - where they exist at the level of enterprises. In the absence of collective agreements, the issues should be incorporated by the trade unions into the company Working regulations. The promotion of green building on the labor market should be incorporated into the future sectoral collective agreement for the construction industry.

5.3 Directions for the social dialogue at European level

Investments in green building in many European countries are much more systemic and more advanced than in Poland. The situation is similar with the advancement of social dialogue focused on green building. In this situation, Poland can use the experience of other countries, both in terms of good practices and avoid mistakes made in other EU

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countries. To some extent, Polish experience can also be used by other European partners. In particular, this applies to education for green building and the introduction of educational programs and standards that would allow effective preparation of specialists. This area is very important for social dialogue, because it should take into account the needs of both employers and employees.

Social dialogue for green building should take place in many areas and focus on all the problems important for the construction market, on the labor market in construction industry and the social dimension of changes in construction. It should focus on both practical problems that can be solved in the short-term perspective and on the strategic vision of the development of construction in the long-term perspective. It should concern both economic and social issues as well as environmental consequences of changes.

In the European dimension, it is necessary to fully involve social partners in the dialogue process by strengthening the coordination of initiatives of national partners at the European level. It is necessary to answer the question to what extent national and structural social partners initiatives regarding this dialogue in individual member states should be more coordinated than in the case of EU legislative initiatives or intergovernmental cooperation. Social partners in the EU countries have greater possibilities of flexible cooperation than governmental and EU institutions moving within a strictly defined formal and legal framework. Coordinated cooperation of social partners in Europe is needed in construction, which is one of the most cross-border sectors.

Construction is a sector connected with many other sectors of EU countries economies. This means that social dialogue for green building should also have a cross-sectoral dimension. The social dialogue in the construction materials industry, the wood sector and the production of construction equipment and machinery has a special significance for the construction industry.

Trade unions have a special role in the social dialogue for green building. They should promote solutions that link green building with the chances of new employment opportunities for new employees. However, the green labor market in construction also requires consideration of the interests and perspectives of current construction workers. Their place and chances on the job market depend on the ability to retrain and acquire new skills.

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Education and training for green building is key to the success of change in the sector. European institutions and agencies of governments of EU countries focus primarily on technologies aimed at CO₂ emissions reduction and faster reduction of energy consumption, on legislative changes and on positive aspects of changes for climate and entire societies. The role of social partners is to draw attention to the need to rebuild the system of vocational education and training in construction sector. The creation of a new system should take place in the process of social dialogue - because system solutions should concern both programs of training new employees as well as retraining programs and creating new workplaces for older, experienced construction workers. In all activities aimed at introduction of European Qualifications Framework and improving the NQF, changes concerning the green economy, including green building should be taken into consideration. In the case of construction, such changes should take place on the initiative of the social partners in the Sectoral Qualifications Framework.

Coordination of social partners' activities at the European level should enable better use and dissemination of good practices in the field of green building - not only in the technological, economical and socio - cultural dimension but also in the field of good solutions for construction labor market. A large part of good practices is introduced in large supranational companies. This applies to both the technical and qualitative areas and certification as well as to the organizational solutions and mechanisms of dialogue. The dissemination of good practices and the creation of a support system for green building will depend on their implementation throughout the entire sub-contracting and supply chain in the sector. The basic tool for implementing these solutions at the European level is the law on public procurement. Social partners participate in the dialogue for change in relevant EU legal acts. However, it is important for them to improve the mechanism of consultation and exchange of information in their environments.

Trilateral dialogue at the European level plays a key role in the promotion and implementation of green building solutions. It does not, however, exclude autonomous dialogue and bilateral agreements between European social partners, which can be faster and more adequate to the needs of the construction sector.

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Country Report and Guidelines on Social Dialogue

SPAIN

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PRELIMINARY CONSIDERATIONS

This report will not refer to the concept of "green construction" but rather that of "sustainable construction," as the latter concept encompasses a broader dimension and is more accurate in its depiction of the phenomenon in question. Sustainable construction is a model, which involves a commitment to the proper management of assets, the efficient use of energy and adaptation to the environment, the necessary environmental protection, and balanced urban development.

Throughout this report sustainable construction is conceived as a reflection of all the steps of its "operation:" conception through urban planning, the embodiment of the idea in project plans, the execution of work, the use and operation of the building and, finally, the end of its useful life, or Life Cycle Assessment (LCA).

Related to this concept, it is essential to link sustainable construction to the idea of the Circular Economy, whose objective is for the value of products, materials and resources (water, energy...) to be maintained in the economy for as long as possible, thereby minimising waste generation.

1. THE SUSTAINABLE CONSTRUCTION SECTOR: MAIN FEATURES

Today everyone is talking about sustainable construction. The term, however, is an adjective that has been attached to all kinds of construction-related activity. There is, to date, no clear, specific and comprehensive definition of what "sustainable construction" is in Spain, since it does not go beyond the promotion of certain environmental issues, such as energy savings, improved energy efficiency, and/or the use of renewable energies. In this sense, it is true that this promotion is having an increasing impact on our public administrations, which are implementing it at the funding level and, in very few cases, at the tax level.

The construction sector in Spain

Excessive growth in the sector in the years preceding the major recession, largely based on residential building, generated distortionary macroeconomic impacts evident in the Spanish production model during this boom period, and magnified the negative effects triggered by the international financial crisis.

One of the reasons for the severity of the economic crisis in Spain was the generation in the years leading up to it of a financial bubble fuelled by an expansionary housing market in an environment characterised by abundant credit extended on the international

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markets. Among other factors, this bubble was responsible for the aggravation of traditional imbalances in the Spanish economy, particularly the external deficit (via an increase in domestic demand as a result of so-called "wealth effect," and a shift in investment flows towards real estate activities, producing a decrease in the production of other goods and services to satisfy that demand) and the limited growth of productivity (also, among other reasons, due to this shifting effect), incompatible with the maintenance of a competitive position.

Though a readjustment was necessary, the data on the current situation show that the size of the sector is now actually below what could be considered normal levels, viewed in terms of its long-term evolution and as compared to the major economies in the European sphere. This makes it possible to argue that if the construction sector is not reactivated it will be difficult to recover previous employment levels, and that the development of another speculative bubble should be avoided.

The key question facing us now is to ascertain what the recovery of the construction sector in Spain will be like: will competitiveness in the sector be improved? Will there be investment in social infrastructure? Will there be a commitment to jobs? What seems clear is that if the sector banks on sustainable construction it will be much more likely to emerge from the crisis reinforced, but this is a decision that must be broadly supported, as construction's push and pull effects are so important that the commitment to sustainable construction and reconstruction must be jointly supported, and cannot lie only within the sector and its players.

2. NATIONAL POLICY FRAMEWORK FOR SUSTAINABLE CONSTRUCTION

2.1. Overview of policies and the relevant legal framework

The development of a sustainable economy in Spain remains stuck at a more theoretical level than a practical one. While the foundations of what "sustainable development" should be in the future are being laid, emphasis is only being placed only on the environmental aspect of the country's economic development, while the social aspect is being passed over, this being great forgotten factor in the entire legislative and regulatory package currently surfacing.

The directives coming from Europe are growing more and more rigorous and demanding, and their transposition into Spanish law forces our industry to demonstrate efforts made by the sector and to report on its strict compliance with the European regulatory

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framework to optimise production processes through the sustainable use of natural resources and waste reduction.

However, there is a lack of coordination between the different levels of Public Administration when it comes to developing the regulatory framework governing sustainable construction. Spain's Autonomous Communities (or regions) are responsible for implementing environmental legislation passed at the national level, but there is no coordination between them when they draft their own legislation, which gives rise to a series of bureaucratic obstacles and administrative burdens placed on companies that operate throughout the country.

Therefore, while efforts have been undertaken to address the environmental aspect, with varying degrees of success, the same cannot be said with regards to the social aspects: industrialisation has the potential to promote, directly or indirectly, a variety of social objectives, such as job creation, the eradication of poverty, gender equality, labour standards, and increased access to education and health care. In this regard the policy objective should be to promote these positive effects, and to limit or eliminate the negative effects of industrial activities on social development.

As for the regulatory sphere, exclusively, in Spain there is a massive volume of legislation – national, regional and provincial, and local – governing various areas that it is impossible to reproduce here. However, one of the issues that was highlighted with the greatest interest during the day for the dissemination of results was the need to evaluate this abundance of legislation regarding sustainable construction in Spain, and not only to verify compliance with it.

2.2. Relevant institutional initiatives in support of sustainable construction

Below are indicated the most important initiatives at the national level in support of sustainable construction. There is an enormous number of regulations related to this issue, but their implementation is not coordinated at the different governmental levels, which represents a significant barrier to achieving the uniform development of sustainable construction in Spain.

2014-2020 National Energy Efficiency Action Plan

This plan features measures such as the Efficient Vehicle Incentives Programme (PIVE), Programme for the Energy Retrofitting of Existing Buildings in the Residential and Hotel Sector (PAREER), the *PIMA Aire* Environmental Promotion Plan, for the acquisition of commercial vehicles; the *PIMA Sol* Plan for the energy retrofitting of hotel facilities, and

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the State Development Plan for Housing Rentals, Building Restoration and Urban Regeneration 2013-2016.

2011-2020 Energy Savings and Efficiency Plan

As a result of the obligations set down in Art. 4 of Directive 2006/32/EC on the efficiency of the final use of energy and energy services, and the *2020 Strategy*, the Ministry of Industry, Tourism and Trade has drawn up this Plan, which includes an annex quantifying the energy savings obtained in 2010 as compared to 2004 and 2007, in accordance with the European Commission's methodological recommendations on the measurement and verification of savings.

The IDAE (Institute for Energy Diversification and Savings), attached to the Ministry of Industry, Energy and Tourism, handled 413 million euros in aid for Energy Efficiency between May 2015 and May 2016 as an entity managing subsidy plans supported by the National Energy Efficiency Fund and the Building Energy Retrofitting Programme (PAREER-CRECE).

The IDAE has taken stock of this 12-month period, and concluded that the programmes are proving successful. In total, the budget managed comes to 413,216,421 euros.

National Energy Efficiency Fund

Lines of action and Grants:

- Municipal outdoor lighting grants
- SME and large industrial company programme
- Modal shift and transport mode support programme
- Subsidy programme for energy efficiency actions in the railway sector
- Subsidy programme for energy efficiency actions at desalination plants.
- Contributions to the National Energy Efficiency Fund.
- "Energy Efficiency 2015" Communication Campaign

These programmes will allow Spain to meet the savings targets set down by Energy Efficiency Directive 2012/27/EU, at the same time providing an important stimulus for investment and employment.

The funding of these programmes proceeds from the National Energy Efficiency Fund and the 2015 General State Budget, and may also be co-financed by the European Regional

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Development Fund (ERDF) under the 2014-2020 Operational Programme for Sustainable Growth.

3. MAIN TRENDS IN THE SUSTAINABLE CONSTRUCTION ECONOMY

3.1. Economic trends in the construction sector

Current situation: below normal activity levels

In 2016 the construction sector represents 4.45%¹ of Gross Value Added (GVA) over the GDP in the first quarter, representing a variation of -0.23% with respect to the same quarter last year. These figures constitute a decrease compared to 2015, when it stood at 5.03%. This last data shows only the most recent developments in the sector; after the relative weight of its GVA in the last two decades peaked in 2006 (11.7% of the total), it has seen a sharp and continuous drop in the wake of the economic crisis.

In fact, construction has been the economic sector hardest hit by the crisis. Since 2007 approximately 1.4 million jobs have been lost in this sector, including those corresponding to auxiliary industries, along with some 250,000 companies, over 30% of those existing in that year.

A long-term analysis of the sector's figures in terms of GVA and employment makes it possible to trace what would be normal levels of construction activity: around 7-9% of GVA, and around 7.5 -10.5% of employment. In both cases, the current data is below normal, especially with reference to employment, which in 2013 saw the lowest figure in the entire EPA (Encuesta de Población Activa, or Survey of the Working Population) series: 5.8%.

During the 2007-2014 period Spain suffered a 2.5% rise in unemployment each year. During this period 58% of the employment destroyed was in the construction industry.

Another example illustrating this drop is cement consumption, which at the close of 2015 stood at 11,408,287 tonnes,² 5.3% more than in 2014. In 2016, however, cement consumption in Spain has fallen by 3.3%, measured in April, coming in at 946,329

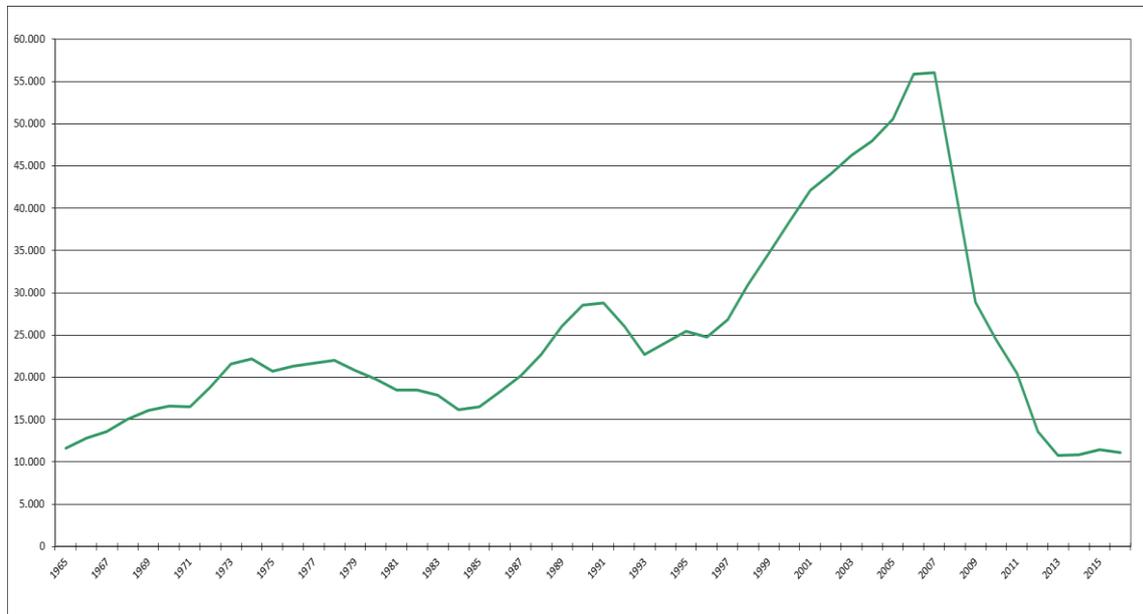
¹Source: Data provided by the CNC (Confederación Nacional de la Construcción), the employers association for the construction sector.

²Source: Data provided by the Fundación CEMA, a joint organisation at the state level and of a tripartite nature, comprised of the cement industry employers' organisation, OFICEMEN; and the sector's two major unions: CCOO de Construcción y Servicios and UGT-FICA, Federación de Industria, Construcción y Agro.

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tonnes, 32,478 tonnes less than a year ago. As noted, we are at the same cement consumption levels as in 1965.

Figure 1 – Cement consumption trend. 1965-2016 (Tonnes)



Source: OFICEMEN

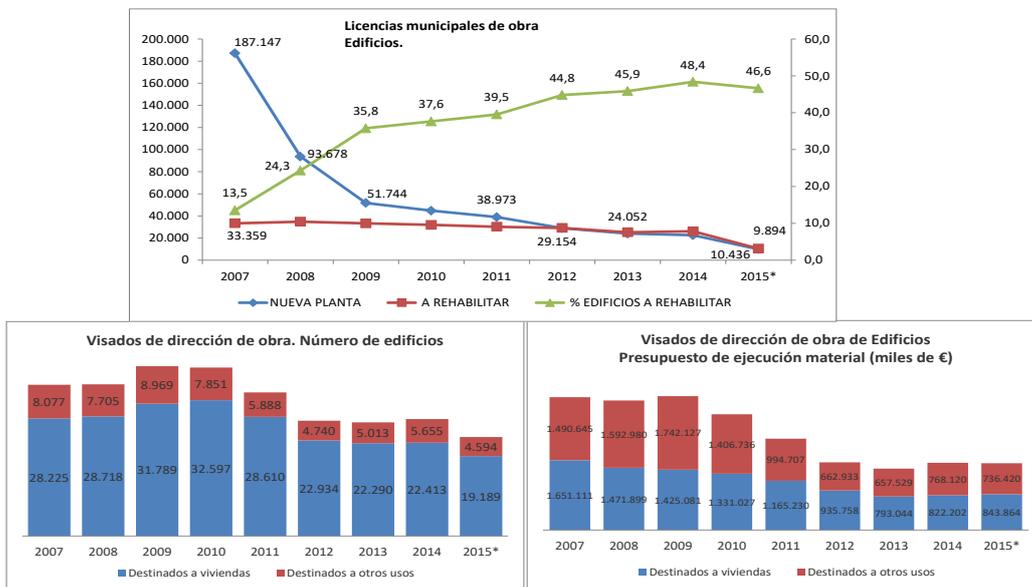
Building and civil works

In 2014 the building subsector represented 78% of the total nominal value of construction production, while civil works accounted for the remaining 22%. Within the building subsector during that year refurbishment and maintenance were those accounting for the greatest percentage of the total (32%), followed by residential and non-residential building, at 27% and 19%, respectively.

The rehabilitation and refurbishment segment, of both buildings and housing, has seen the least decline within overall construction activity. It also constitutes one of those with the greatest potential to resuscitate activity, given the demographic trends in Spain and the need for it to adapt its housing and facilities to new environmental, energy and social demands.

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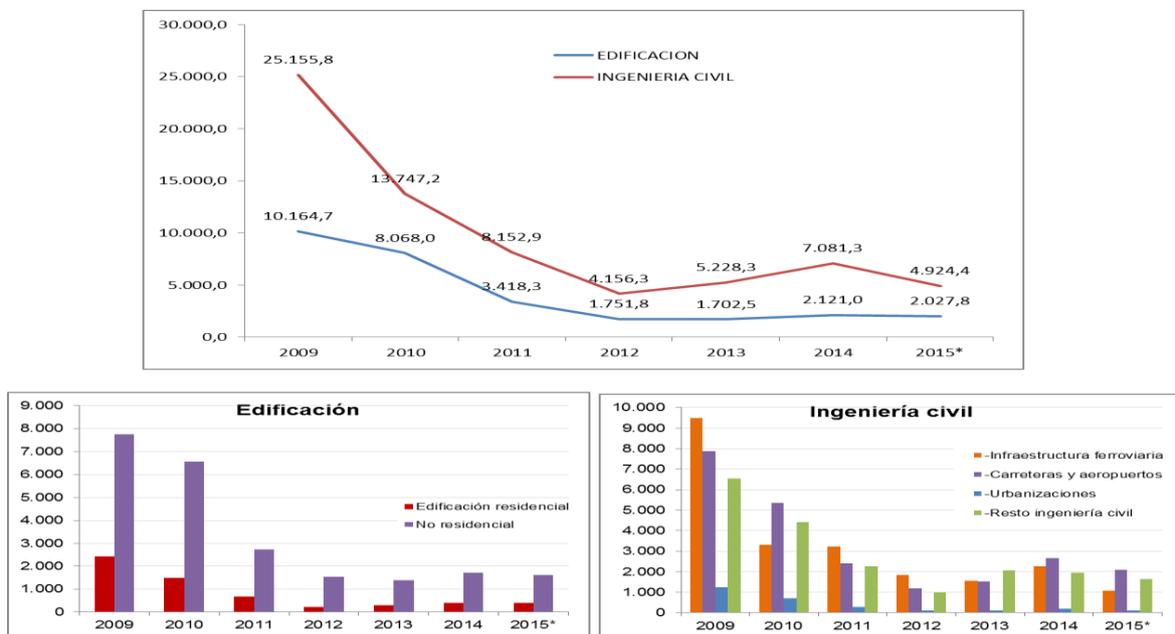
Figure 2 – Building permits and rehabilitation activity licenses



Permits: data until May 2015. Licenses: data until September.

Source: Report 02/2016 on "The role of the construction sector in economic growth: competitiveness, cohesion and quality of life." Economic and Social Council of Spain, (CES). 2016.

Figure 3 – Official tendering by type of work, 2009-2015 *



* Data until October

Source: Report 02/2016 on "The role of the construction sector in economic growth: competitiveness, cohesion and quality of life." Economic and Social Council of Spain, (CES). 2016.

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Characterisation of the business community

In 2015 the number of companies engaged in Construction in Spain stood at 405,849. During the crisis years, since 2008, the drop in this number for construction was the most dramatic of all classes of Spanish companies: 37.8% vs. an average decline of 8.9% in the number of companies in Spain. Thus, construction companies represented 13% of Spain's entire business community in 2015, as compared to 18% in 2008.

In 2015 the number of companies in Spain rose, but the number of construction companies fell again, by 0.5%.

The destruction of the business community affected to varying degrees the different construction-related branches, and did not affect businesses of different sizes in the same way.

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Table 1 – Construction companies by size*, 2008-2015 (number and percentage)

	2008	2015	Weight in 2008	Weight in 2015	Variation from 2008 to 2015	Variation from 2014 to 2015
Total Construction Companies						
Total	622,096	405,849	100.00	100.00	-34.8	-0.5
Small	616,938	404,655	99.2	99.3	-34.4	-0.6
Microbusinesses	574,633	393,192	92.4	93.4	-31.6	-0.5
Medium-sized	4,424	1,014	0.7	0.6	-77.7	3.3
Large	734	180	0.1	0.1	-75.5	-7.2
A) Building Construction						
Total	359,563	223,476	100.00	100.00	-37.8	-1.3
Small	356,630	223,106	99.2	99.4	-37.4	-1.3
Microbusinesses	331,951	218,423	92.3	93.6	-34.2	-1.3
Medium-sized	2,518	329	0.7	0.6	-86.9	4.8
Large	415	41	0.1	0.0	-90.1	-2.4
B) Specialised Construction Activities						
Total	245,063	168,639	100.00	100.00	-31.2	1.1
Small	243,369	168,068	99.3	99.4	-30.9	1.1
Microbusinesses	226,816	162,257	92.6	93.2	-28.5	1.1
Medium-sized	1,495	486	0.6	0.6	-67.5	4.7
Large	199	85	0.1	0.1	-57.3	-3.4
C) Civil Engineering						
Total	17,470	13,734	100.00	100.00	-21.4	-6.9
Small	16,939	13,481	97.0	97.5	-20.4	-6.9
Microbusinesses	15,896	12,512	91.0	91.2	-21.3	-6.8
Medium-sized	411	199	2.4	2.0	-51.6	-2.5
Large	120	54	0.7	0.5	-55.0	-15.6
Total Companies (CNAE)						
Total	3,422,239	3,186,878	100.00	100.00	-6.9	2.2
Small	3,391,471	3,164,380	99.1	99.2	-6.7	2.2
Microbusinesses	3,219,393	3,053,761	94.1	94.5	-5.1	2.2
Medium-sized	24,303	17,431	0.7	0.7	-28.3	2.7
Large	6,465	5,067	0.2	0.2	-21.6	0.6

* An effort was made to follow European Commission Recommendation 361/2003 to classify companies by size based on their numbers of workers, but large companies were considered to be those with more than 200 workers (not 250) because the DIRCE (Central Business Directory) does not provide this information.

Source: Report 02/2016 on "The role of the construction sector in economic growth: competitiveness, cohesion and quality of life." Economic and Social Council of Spain, (CES). 2016.

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The innovation of processes and products as key to the sector's permanent competitiveness

Despite some progress in recent years, the data on R&D show a lower weight of these activities in the construction of that they have in the whole economy. According to the INE's R&D statistics of 2014 (Instituto Nacional de Estadística - Statistics National Institute), in that year the branches of activity within the construction sector would have contributed 3% of the companies to the Spanish total in R&D, 2.8% of the staff and 1.9% of expenditure. Such contributions are below the weight of the sector in the economy.

The materials and related industries would, on the other hand, be above the total in these same parameters, although of course with considerable margin to increase them.

It is not a question of the lack of research and innovation in construction activity, but the intramural R&D activity of firms in the construction sector is less frequent than that of the total productive sectors.

In the innovative activity of companies, construction also shows values lower than those of the economy as a whole, and especially those of the manufacturing industry.

The main indicators of technological innovation of the companies in Spain indicate a delayed position of the construction. And the weight of new and improved products in the sector's total turnover was lower than in industry and services. Finally, the total expenditure on innovation would be about 30 times lower than in industry and services, which gives a full idea of this delay.

These indicators vary according to the size of the enterprise, so that both the weight of innovative firms and the intensity of innovation are greater in the companies segment of more than 250 workers.

In non-technological innovation, the weight of innovative firms in construction is as low as in the case of technology, and differences in behavior by size are also seen.

However, the process of internationalization of the Spanish construction industry would not be viable without a high technological capacity and high productivity capable of sustaining that position in competitive markets. In this sense, we can speak of signs of positive change in the sector in terms of innovation.

There is ample room for improvement in innovative construction activity, which must assume major challenges for the future, almost all of which require a high level of innovation and application of new technologies.

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The factors that may be limiting greater innovative intensity are basically structural, associated with the characteristics of the sector and the very nature of the activity. Construction is a heterogeneous and fragmented sector, which includes many professions, with high dependence on economic cycles, relatively less skilled labor force and high mobility and work in external conditions, among others.

3.2. Employment trends in the Construction sector

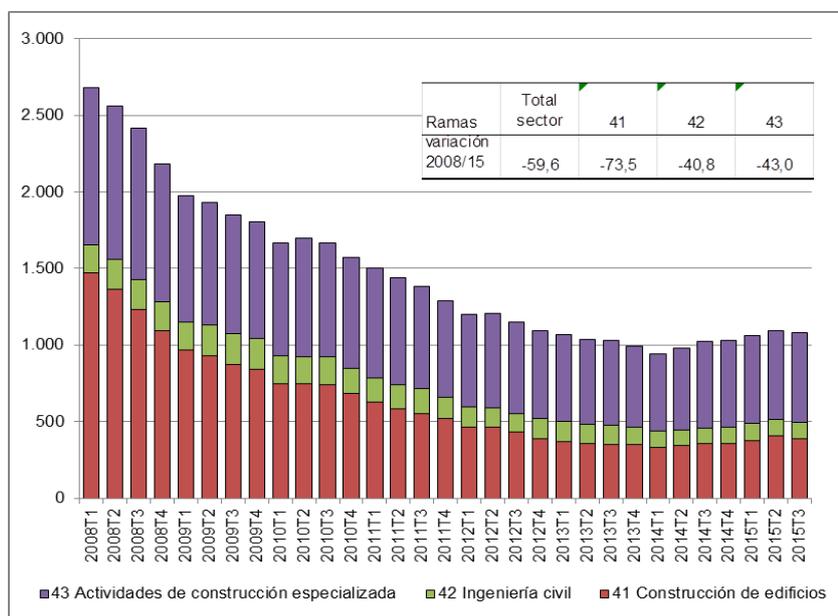
The employment trends in the Construction sector depend upon the activity or specific sub-sector in question. Activities related to the construction of buildings, and also specialised construction require large numbers of employees, and feature a greater number of temporary jobs associated with the work, and jobs requiring little or moderate skill levels, with a clear predominance of small businesses and a greater frequency of self-employment. In contrast, civil work activities require less employment, and structures more often featuring permanent jobs, along with a prevalence of technical occupations requiring intermediate or advanced skill levels, and larger companies. The presence of self-employment, meanwhile, is nominal.

The employment trend in the sector has been sharply downward in the three areas, but especially in the case of Building Construction, which in 2015 had 73.5% fewer jobs than in 2008.³In the Civil Engineering field there was a 40.8% decrease, and in Specialised Construction the drop was 43%.

³ The omission of the year 2007 in the series and the reference to the 2008-2015 period is explained by the change at the CNAE (National Classification of Economic Activities), which limits the comparability of data prior to 2008 in the case of different activity branches.

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Figure 4 – Construction employment by area of activity, 2008-2015 (Thousands of people, quarters; % variations in the overall period)



Source: Report 02/2016 on "The role of the construction sector in economic growth: competitiveness, cohesion and quality of life." Economic and Social Council of Spain, (CES). 2016.

Professional profiles

Although given the current situation in the sector it seems that all occupations, in general, will undergo modifications in order to boost production and enhance professionalism, these are the job profiles most affected in terms of energy savings, according to the Report on the Status Quo of Build Up Skills:⁴

- Roofer
- Insulation installer
- Roofer and storm water network installer
- Construction worker
- Joint sealer
- Quality and environmental control technician
- Aluminium carpentry and PVC fitter
- Authorised hot water and climate control systems installer
- Photovoltaic solar installations fitter

⁴ Build up Skills is a strategic initiative under the auspices of the Intelligent Energy Europe (IEE) programme, which was launched in 2011, but which is still in force through Build up Skills *Construye 2020* (Build 2020). More information at www.buildupskills.eu

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However, the occupations with the greatest need for modernisation in this area are:

- Foreman
- Construction worker
- Plumber
- Heating, hot water and climate control installer
- Gas fitter
- Quality and environmental control technician
- Electrician
- Insulation installer

3.3. Qualification and training needs

The Build Up Skills project identifies the following occupations as those most in need of training in the Energy field:

- Joint sealer
- Aluminium carpentry and PVC fitter
- Solar heating systems installer
- Construction worker
- Installer of heat generation systems harnessing geothermal energy
- Installer of heat generation systems drawing upon biomass combustion
- Plumber
- Photovoltaic systems installer
- Authorised hot water and climate control systems installer
- Roofer and storm water network installer

It also identifies the skills with regards to Energy Efficiency and Renewable Energy most in need of development through training:

- Aluminium carpentry and PVC: mainly the replacement of exterior carpentry
- External walls: isolation and the removal of thermal bridges
- Roofing: Insulation
- Partitions: insulation
- Hot water installations
- Plumbing installations
- Air conditioning installations
- Gas installations
- Electrical production equipment

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- Electrical installations
- Electricity production

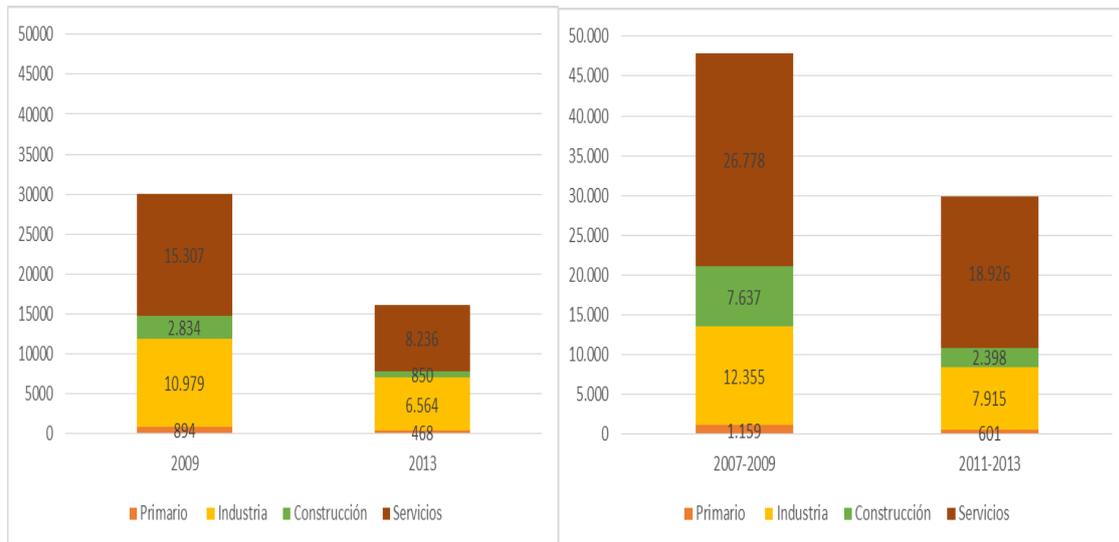
The progressive introduction of innovations in products and materials is altering the construction process, introducing new and greater requirements with regards to training and, in general, qualifications and professional skills in the sector.

Concern over the disappearance of jobs in the sector is due not only to the number of jobs lost, but also the fact that most of these jobs cannot be recovered, due to the high degree of specialisation. Job loss also entails the loss of technological knowledge. Moreover, during the period of maximum expansion in the construction field, the former idea of the general worker gave way to that of the specialised professional, making the training of workers during this period very specific. At present, however, companies are once again looking for workers with more general and versatile profiles.

3.4 Changes and innovations in the sustainable construction economy

In line with the decline in activity and the sheer number of companies due to the crisis, which was concentrated in some branches, the largest decreases in technological innovation, in relative terms, correspond to construction, at 79%.

Figure 5 – Innovative companies in Spain, 2009 and 2013. (Technological innovation, years, non-technological innovation, trienniums)



Source: Report 02/2016 on "The role of the construction sector in economic growth: competitiveness, cohesion and quality of life." Economic and Social Council of Spain, (CES). 2016.

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Material industries and other related ones are, however, making more investment efforts.

In Spain the links between universities and technical schools and businesses have traditionally been very tenuous and, despite progress in recent years, continue to be weaker than those boasted by neighbouring countries.

Public-Private Partnerships

The development of the sector requires access to alternative funding sources, for which there are, essentially, two channels:

- Government taking on a more active role as a direct funder of projects
- More streamlined instrumentation, and with greater security for investors, for access to capital markets as an alternative and complementary funding source.

A Public-Private Partnership project must demonstrate conditions of safety and profitability that are difficult to achieve without the presence of strong public guarantees.

Life Cycle Assessment and Environmental Product Declarations: where the sector is headed, and where it should be.

The evaluation of products and services from a life cycle perspective is a growing demand by both public and private clients. The signals given by legislation, such as that of the European Commission and private clients, indicate that communications regarding environmental performance based on Life Cycle Assessments are a necessary tool for organisations seeking to compete in increasingly demanding markets.

Environmental Product Declarations (EPDs) represent a benchmark for public and private purchasing at the global level.

The European Commission is moving in the direction of considering environmental aspects based on Life Cycle Assessments to establish the purchasing criteria for the initiative of a Single Market for Green Products, featuring several Product Environmental Footprint (PEF) pilot projects. The PEF methodology uses an approach similar to that of the EPDs (Environmental Product Declarations), based on the same ISO 14025 standard, international LCA standards, and the International LifeCycle Data Reference System - ILCD) published by the Joint Research Centre (JRC).

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With regards to **the cement industry**, in recent years Spain has invested heavily in R&D to produce different high-quality cements delivering great added value, internationally recognised in this regard. A very important role in this function has been played by the Instituto Español del Cemento y sus Aplicaciones (Spanish Institute for Cement and its Applications), or IECA.

3.5 Obstacles and barriers to the development of sustainable construction

Given that there is no clear definition of what sustainable construction is, as stated at the beginning of this document, actions being taken towards its development have a limited impact on key areas, such as reducing CO₂ emissions in the different sectors, and returns on investment. As a positive and significant effect, worthy of mention is the improved comfort enjoyed in homes and enhanced quality of life for those residing in them.

As for the incorporation of environmental aspects into the products used in the construction sector, there is much still to be done. Initiatives in this regard are scarce, and only through verified environmental information, based on the full Life Cycle Assessment of the building or project is it possible to have an accurate assessment of the building's environmental performance during its construction, use and end of life (waste generation) phases. This statement needs two points of support for its full development: one is technological, which through BIM (Building Information Modelling) technology can make possible a comprehensive calculation of the building's environmental performance over the course of its life cycle; and, secondly, the political or administrative aspect: governments, through current and developing legislation (public procurement, implementation of the CTE [Technical Building Code], market surveillance, etc.) can publicise this environmental performance.

Three types of barriers to the development of sustainable construction in Spain have been identified: economic, administrative and cultural.

Economic barriers

- Scant public investment: it has gone from 4.6% of the GDP in 2007 to 2.1% in 2014.
- The credit crunch has led to a decline in public investment, which impedes the development of major infrastructure for residential areas or neighbourhoods.
- The limited effectiveness of the Juncker Plan: government investment entails the calculation of increased deficits.
- The promotion of green purchasing through specific methodologies: fomenting BIM (aforementioned) and LIM technology.

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- Construction projects in Spain today, by their very nature, and the jobs linked to them, will not be able to generate as many jobs as those that were destroyed.
- Most companies in the sector in Spain are small businesses, which struggle to obtain funding and boost their workers' skills and qualifications.
- The limited demand for energy retrofitting by end customers (that is, owners), who must cover at least part of the investment with their own funds. Due to the trying economic situation, the lack of private funding, deficient environmental awareness, etc., there is only investment in those elements for which there are subsidised programs.
- Spanish companies will see reduced profits if the economic dynamic remains this way, and they will continue to take only those actions mandated by EU legislation.

Administrative barriers

- The lack of coordination between the various actors and authorities charged with responsibilities in the area of construction, in general, and sustainable construction, in particular. The role of all the public authorities involved and the various actors engaged in the sector is key, but difficult to coordinate.
- The need for genuine state viability plans for refurbishment and investments in infrastructure and public works.
- There are administrative barriers between EU countries: national regulations are not coherent, which means that there may be problems in the marketing of certain products depending on which EU countries one is dealing with. It would be desirable to establish a minimum requirement for them, and for them to be consistent, entailing proven levels of effectiveness and efficiency.
- Barriers have also been detected in the sector when Spanish workers go to work in other EU countries. In order to resolve this situation in the sector, the Fundación Laboral de Construcción maintains collaboration agreements with agencies and community organisations from other countries so that Spanish workers in the sector can train and work in other European nations.
- The limited access of SMEs to training: a significant portion of SMEs in the sector are unaware of the channels to obtain training subsidies, and many small and medium-sized companies do not know what their needs are or the direction in which they are headed. Access to training is limited by the insufficient dissemination of plans, as well as a lack of adaptation to their needs.
- A lack of guidance: there is not enough demand for training by the least skilled workers, and, when there is training, it is inadequate. The main problem is reaching out to the least skilled and qualified workers, because they do not know what the sector is demanding, how it is evolving, or where to find information.

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- As a result of the crisis, many workers have been out of the construction sector, and during these crisis years two important directives were transposed via the Technical Building Code and its revision in 2013. Therefore, they are not accustomed to working in accordance with the new requirements introduced.
- Little government support: the measures taken to heighten consumer awareness have had a limited impact, and the economic measures have been weak.

Cultural barriers

- In the construction sector there is a clear polarisation amongst workers: on one side, a group of highly skilled and trained professionals and, on the other, workers lacking in these areas. Therefore, it has been suggested that it would be desirable to require training in energy efficiency, above all to reach out to the workers with the least training, who, for different socio-cultural reasons, often fail to receive it.
- Motivation: Although training makes it possible for one to improve his qualifications and acquire new skills, this is often not enough to motivate workers to make the effort required. Hence, the mandatory accreditation of qualifications stands out as an important driver of progress.
- The languages of immigrant workers: The construction industry employs many foreign workers. While many of them know Spanish, there is a significant proportion of workers who do not, hindering their access to training offered.
- The myth that the most sustainable construction means lightweight construction, or the myth that construction employing materials or products obtained via processes free of CO₂ is the same as the most sustainable construction. To overcome this barrier it is necessary to make the use of Life Cycle Assessments widespread as a reliable sustainability evaluation tool. In this regard Environmental Product Declarations play an important role, as discussed above.
- Not making incomplete comparisons between materials. There must be a newfound stress placed upon architectural plans, on comprehensive construction solutions.
- Deficient ecological awareness in the country in general (shared by other countries).
- A lack of market demand for sustainable construction: end customers are unaware of the benefits entailed by sustainable construction, and are mainly motivated by property prices.
- It is very important to promote smart urban approaches consonant with the concept of the Smart City as an integrative way to address sustainable construction in

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urban development, thereby meeting the real estate sector's demand for properties and enhancing citizens' quality of life.

4. SOCIAL DIALOGUE AND SUSTAINABLE CONSTRUCTION

4.1. Employment relations systems in Spain (in general, and for the Construction sector)

Unlike the scenario characterising much of the Spanish employee relations system, the construction sector features a well-defined model, which began in 1988 with the Inter-professional Framework Agreement for Construction (AMIC), and has continued to be developed in successive accords and general collective agreements in the sector. The AMIC was structured around three elements:

- A general agreement at the national level, of a permanent nature;
- A State agreement, of a dynamic and flexible nature, containing the specific application of inter-confederal agreements on collective bargaining and other specific matters agreed to in the framework of inter-confederal social or industry dialogue;
- Provincial or Autonomous Community agreements, featuring the specific implementation of higher-level agreements, as well as matters peculiar to the territorial scope they affect.

Business organisations

In the field of construction and its related activities the creation and consolidation of business entities has been shaped by the negotiation of General Agreement I governing the Construction Sector (I CGSC).

This process made possible:

- The consolidation of the state construction employers association as a representative of the industry's businesspeople, with the entity being assigned certain prerogatives in this capacity.
- It also gave rise to other business formulas and the creation of new collective bargaining forums.

At first the employer associations formed part of the Confederación Nacional de la Construcción (CNC). The signing, in April of 1992, of the 1stCGSC marked the beginning of a new era in labour relations. Numerous business entities linked to the sector decided

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that they did not feel represented by the CNC, concluding that their interests in negotiations with the CGSC had not been taken into account.

This process gave rise to Oficemen, the employers association for the industries of cement and concrete and their by-products; gypsum, lime, plaster, tiles and ironwork. However, shortly after all the business organisations had broken away from construction, they once again regrouped. Thus, in 1991 the **Confederación Española de Asociaciones de Fabricantes de Productos de Construcción** (National Confederation of Construction Product Manufacturers), or **CEPCO**, was formed. CEPCO is, in turn, part of the CNC.

The **Confederación Nacional de la Construcción (CNC)** constitutes the umbrella organisation of the construction sector in Spain, comprising the vast majority of business organisations in the sector. Founded in 1977, it aims to represent the sector before public authorities and other national and international, public or private entities.

There was, moreover, the **Confederación Española de Empresas de la Madera**, or Spanish Confederation of Wood Businesses (**CONFEMADERA**), a non-profit organisation founded in 1977. This was the business organisation responsible for representing, promoting and defending the professional interests of the associations and federations that made it up and, by extension, the entire set of businesspeople in the wood sector. Due to the effect of the economic crisis on the wood and furniture industry, this association disappeared, which hinders collective bargaining processes in these industries, as it is necessary to negotiate with different employer associations defending individual interests.

Joint industry entities

Perhaps the most novel element that collective bargaining has yielded, along with the extension of State Conventions to all subsectors, has been the constitution of joint entities arising from it.

At present there are three sectors (Construction, Wood and Cement) that have created a Labour Foundation, relying on its specific collective bargaining efforts. This is a model that is being imitated in other productive sectors of our country, as it is considered a useful element in the democratisation of employee relations and for the achievement of new union objectives.

The **Fundación Laboral de la Construcción (FLC)** is a joint, non-profit body based on a culture of consensus and made up of the sector's most representative entities:

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Confederación Nacional de la Construcción (CNC), CCOO de Construcción y Servicios, and the Federación de Industria, Construcción y Agro (FICA-UGT).

The Fundación Laboral de la Construcción harbours has its ends the creation and management of one or more funds – sustained by contributions from businesspeople, employees and third parties – to provide services such as vocational training, occupational risk prevention and the promotion of employment for the benefit and enjoyment of those who provide services or belong to the general Social Security system in this sector, at the workplaces of the companies that fall within the scope of the General Agreement for the Construction Sector (CGSC).

Its primary purpose is to create a framework of stable and fair labour relations and to provide services to workers and businesses.

To meet these goals the Foundation supports various activities, including:

- All types of training activities, the implementation of training plans, contracts/programmes, as well actions complementing training actions.
- Assistance in the development of procedures for the validation, accreditation and certification of training.
- Collaboration with the corresponding State and Autonomous Community entities for the methodological and operational determination of qualifications and their content with reference to skills.
- Collaboration with the government to structure the different training, guidance and employment promotion initiatives in the construction sector.
- The issuing and monitoring of a professional identification document for all construction sector workers.
- The organisation and tracking of visits to worksites to improve prevention efforts by businesspeople and workers.

The Fundación del Cemento y el Medio Ambiente (Cement and Environment Foundation), or (CEMA), was constituted in late 2005 under the auspices of the Agrupación de Fabricantes de Cemento de España (OFICEMEN, or Spanish Cement Manufacturers Association) and the unions FECOMA-CCOO and MCA-UGT (currently CCOO de Construcción y Servicios and the Federación de Industria, Construcción y Agro (FICA-UGT).

The initiative to establish this foundation arose from the Energy Reclamation Agreement signed in 2004 between the cement employers association and the major unions to

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promote this environmental practice, as the cement industry considers the environment a strategic variable in its management and the use of waste as the best option to reduce CO₂ emissions.

The first Energy Reclamation Agreement lasted four years (from 2004 to 2008), and was extended for another. In December of 2010 the three organisations agreed to sign a new Agreement for the sustainable use of resources, environmental protection, public health, and the Spanish cement sector's improved competitiveness.

In general terms, the purpose of the Foundation is to pursue actions aimed at raising awareness and creating a culture reconciling economic and social progress with a respect for the environment and natural resources, ensuring the health of workers and citizens and improved quality of life for both the present and future generations.

La Fundación Laboral de la Madera y el Mueble (Labour Foundation of Wood and Furniture), or FLMM

The 3rd State Convention on Wood (2007-2011) called for the creation of a working group to study the founding of a Labour Foundation to feature a set of core actions: training, occupational risk prevention and promotion of the wood sector itself.

This work was completed in 2012 with the signing of the 4th State Convention, which stated that: "The FLMM is the sector's joint body, its purpose being to ensure the provisioning of services to workers and businesses within the scope of the State Convention, affecting all of Spain, and governed by its own statutes."

The Foundation's objectives include:

- Promoting vocational training in the sector
- Research, development and actions to improve occupational health and the prevention of occupational hazards.
- Bolstering employment
- The growth of competitiveness and the development of the sector through improved working conditions
- The taking of actions aimed at the personal, professional and social development of workers in the wood sector.
- The promotion of the wood and furniture sector as an industry important to the country's economy

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Another significant initiative in the field of sectorial social dialogue is the Foro del ciclo integral de la construcción (Comprehensive Construction Cycle Forum). The employers association and unions from the construction sector created the Forum in 2013, which is made up of the social agents representing the construction sector in Spain: the CNC (Confederación Nacional de la Construcción) employers association, CCOO de Construcción y Servicios, and the Federación de Industria, Construcción y Agro (FICA-UGT).

The Forum decided to join forces with the aim of proposing solutions to the crisis and achieving a reduction in unemployment, in the short and medium term, and generating wealth for the Spanish economy so that it can meet the commitments it has undertaken with both the European Union and Spanish society. The Forum considers it essential to safeguard the competitiveness of what remains of the construction sector in Spain, not only with a view to economic growth and employment in general, but also to ensure the sector's sustainability.

The Forum holds that "with the support of the appropriate policies to stimulate demand and promote investments, Construction could significantly contribute to the creation of jobs, increasing its activity in the field of infrastructure and other promising areas like rehabilitation, regeneration and urban renewal."

In conclusion, it can be said that in Spain the Social Dialogue in the Construction sector constitutes an example of good performance, as illustrated by the aforementioned experiences. However, it represents a bipartite social dialogue between the sector's employer and business organisations, with little support by the Public Administration (or the different governmental levels: national, regional, provincial and local).

4.2. The role of social dialogue in support of the sustainable economy and sustainable construction

Sustainable construction is one that, throughout its life cycle, addresses in a balanced way the three dimensions – social, economic and environmental – of sustainable development.

Social agents play a dual role in the development of sustainable construction: firstly, through their participation at the technical level, in the legislative tools and technical codes that define sustainable construction, and, secondly, as guarantors of respect for ethical standards, viable social environments, citizens' participation, occupational health and safety, innovative financial models, the improvement of environmental conditions,

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and the dissemination of knowledge in the academic, technical and social spheres. It is in these latter areas where the role played by social partners is even more important than in the former.

Training for sector workers is vital, as is the recognition and certification of this training being carried out in Spain. A sustained commitment must be made in this area.

Social agents, meanwhile, continue to support and promote actions so that sustainable construction plays an important role, facilitating the sector's restructuring.

An example of a good practice undertaken by the sector is the Observatorio Industrial del Sector de la Construcción (Construction Sector Industrial Observatory), created on May 7, 2009 through the signing of a collaboration agreement by the la Fundación Laboral de la Construcción, the Federación Española de Entidades de Innovación y Tecnología (Spanish Federation of Innovation and Technology Entities), or FEDIT, and the Ministry of Industry, Tourism and Commerce. As a result of this initiative various studies of the Construction sector were completed, in 2009, 2010 and 2011.

This initiative, unfortunately, has been discontinued. It represented, nevertheless, one of the most important tripartite social dialogue efforts undertaken in Spain on behalf of the construction industry.

The employer and union organisations that have contributed to the drafting of this report believe that it is impossible to make a clear commitment to sustainable construction in the country without governmental support. Ephemeral examples, as mentioned, like the Observatorio Industrial del Sector de la Construcción, lead them to conclude that this is the right approach, but these organisations do not know how to involve and engage the government in the social dialogue necessary to promote sustainable construction.

It is imperative for these organisations to create forums for debate and dialogue with the country's different Public Administrations, in order to effect a commitment to Sustainable Construction. The greatest challenge is to verify what governmental authorities are willing to cooperate, and how stable coordination between them can be achieved. It is also essential to create discussion forums in order to foster the cohesive development of Sustainable Construction in Spain.

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4.2.1. Other supports for the sustainable economy

Sustainable Economy Strategy and Sustainable Economy Law

In Spain we have a **Sustainable Economy Strategy**, approved in November 2009, which articulated an extensive program of reforms, whose main objectives are: increased investment in research, development and innovation; the promotion of activities related to clean energy and energy saving; the transposition of the Services Directive.

The sustainability pursued is of three types:

- Economic, based on improving competitiveness, innovation and training;
- Environmental, taking advantage of the essential rational management of natural resources to promote new activities and new jobs, and
- Social, pursuing equal opportunities and social cohesion. Much of its content will appear in other legal and regulatory texts.

The **Law of Sustainable Economy** of March 2011 is one of the most important pieces of this Strategy as it addresses many of the changes that are necessary to achieve those objectives. This Law aims, as a fundamental objective, to lay the foundations for the implementation of a model of development and growth of a more sustainable economy.

The Law of Sustainable Economy is based on three main pillars: improving the economic environment by establishing a stable and predictable regulatory framework with low administrative burdens, boosting competitiveness; and the commitment to environmental sustainability.

According to an opinion on the Draft Economic Law of the ESC (Economic and Social Committee of Spain), the objectives of the Law of Sustainable Economy are positively valued as the desire to seek a short, medium and long term horizon .

The ESC understands that the implementation of a law as ambitious as this one should have management, monitoring, control and supervision instruments in the presence of public authorities and economic and social actors, as well as the resources that are necessary, beyond the necessary coordination between Administrations, all in order to facilitate the assessment of impacts on the business fabrics and on the greater efficiency of Public Administrations.

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In the opinion of the ESC, sustainable development must be a genuine State policy, it must have the explicit support of a large majority of the groups that make up the Spanish political landscape, the social partners and the citizens. Sustainable development policies are medium and long term and require broad integration.

The Economic and Social Council wants to draw attention to the practically null development of the social dimension of the growth pattern that the Law aims to promote. Thus, although the definition of sustainable economy included in the text establishes that the development model, in addition to economic growth and environmental sustainability, should promote quality employment, equal opportunities and social cohesion, there are no more than sporadic mentions of these objectives throughout the article. In addition, the text should specifically address, and set out guiding principles, strategies and measures, in areas crucial to achieving long-term social sustainability, particularly in relation to the social protection system, improvement of the education system, with the strengthening of the health system, the articulation of demographic policies, the creation of quality employment, the promotion of rural and territorial development and agriculture as a strategic sector, and the promotion of equal opportunities and social inclusion .

The Council also considers that it is necessary to include the impetus for industrial development and a model of agriculture and food that is sustainable from the social, economic and environmental point of view, which generates employment and which helps the balanced settlement of the population in rural areas, among the principles that inspire this Law, in a coordinated and articulated way with horizontal actions.

In environmental matters, the opinion notes that there is an absence of aspects relating to waste management and water resources, as well as the agricultural sector, taking into account the importance of this sector in the environmental field. The ESC also understands that no energy technology should be discriminated against at the outset and that the economic and social debate should be deepened on the basis of the appropriateness of each one.

Finally, in the area of housing, the Council considers that the approach should be more ambitious and address a more comprehensive approach through a sustainable urban rehabilitation law that regulates all relevant aspects to improve the sustainability of urban and rural environments, including dimensions such as social cohesion and emission reductions. In addition, in the opinion of the ESC, all public administrations should redouble their investment efforts in the area of housing rehabilitation and consolidated urban fabric.

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Environmental Delegate and the Environment Commission

In Spain there is the environmental delegate, who is the subject of rights and obligations in environmental matters in the company or work center, which is a member of the works council or delegate of staff. In the event that this designation is not possible, the delegate of prevention with environmental competencies may be provided.

The competencies and faculties of the delegate of the environment are:

- Information: receive environmental information and documentation.
- Advice: receive external advice to the company.
- Inspection: of workplaces, procedures and records and communication of results to workers.
- Monitoring: compliance with environmental obligations, objectives and targets.
- Prior consultation and in good time of the significant actions and commitments undertaken by the company.
- Training: specific and provided by the company.
- Communication: with the company and with the workers.
- Time credit system
- Guarantees against reprisals or discrimination in the exercise of their functions.
- Proposal: to adopt measures to prevent environmental risks and improve environmental performance.
- Complaint: before the competent authorities in this matter.
- Work stoppage or suspension of activities: in case of serious and imminent risk to the environment.

In companies with sufficient volume and resources, an environmental commission can be created. It is a joint body with representation of workers and of the company for environmental issues. Its functions will be:

- Promote the improvement of the environmental performance of the company.
- Participate in the identification and evaluation of environmental risks.
- Participate in the development and evaluation of environmental policies and action plans.
- Participate in the implementation and operation of the measures adopted for the environmental sustainability of the company.
- Participate in the implementation and regular operation of environmental management systems.

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- Report on new techniques and technologies in relation to their environmental effects.
- Report on training plans.
- Access the necessary information and documentation.
- Propose the presence of experts outside the company.

An example of good environmental practices in the construction sector is the II Agreement for the sustainable use of resources, protection of the environment, health of people and improvement of the competitiveness of the Spanish cement sector.

This agreement was signed on January 14, 2014 by the Cement Manufacturers Association of Spain, OFICEMEN, on behalf of the companies in the sector, and on the other hand, by MCA-UGT and FECOMA-CC.OO. on behalf of the workers concerned.

The signatory parties consider it a priority to make economic and social progress compatible with respect for the environment and natural resources and with the guarantee of workers' health in order to improve the quality of life. The main objective of the Agreement is to collaborate jointly in the development of initiatives that promote the sustainable use of resources, the protection of the environment and human health, thus achieving a continuous improvement of the competitiveness of the Spanish cement sector.

4.3. The position of social agents with respect to the economy and sustainable construction

Government is not making a commitment to Sustainable Construction through the instrument of Social Dialogue. Although it is managing the European funds allocated for its development and undertaking other kinds of initiatives that encourage it, it is employing its own approach.

The stances of union and employer organisations involved in the development of Sustainable Construction in Spain centre on promoting Life Cycle Assessments and Environmental Product Declarations.

For these organisations the evaluation of products and services from a life cycle perspective is a growing demand, and one that promotes the development of Sustainable Construction. In addition, the disclosure of environmental performance based on Life Cycle Assessments is a necessary tool for organisations seeking to compete in increasingly demanding markets, as it is the direction in which Sustainable Construction is headed.

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EPDs (Environmental Product Declarations) present the environmental profile of a product or service through quantified environmental data, in accordance with the applicable European and international standards. These statements provide, in a transparent and verifiable manner, information on products' environmental performance throughout their life cycles. In addition, DAPs make it possible to highlight products that respect the environment, offering relevant, transparent, comparable and verified information.

In addition, as stated above, employer and union organisations consider it essential to create forums for debate and dialogue with the different Public Administrations. The main challenge is twofold: first, to ascertain how it is possible to organise stable coordination between the different Public Administration entities; and, secondly, to create fields of discussion for the coherent development of Sustainable Construction in Spain.

4.3.1. Drivers and barriers for the social dialogue

The main drivers for social dialogue in construction sector are in Spain are:

- A well-defined model of labour relations which began in 1988, meaning an example for other sectors in Spain.
- Creation and consolidation of business entities, which also gave rise to other business formulas and the creation of new collective bargaining forums.
- The constitution of joint entities for different issues in the sector: Training and H&S; Cement and Wood. This model is being imitated in other productive sectors in Spain, as it is considered a useful element in the democratisation of employee relations and for the achievement of new union objectives.
- The dual role that social agents play in the development of sustainable construction: firstly, through their participation at the technical level, in the legislative tools and technical codes that define sustainable construction, and, secondly, as guarantors of respect for ethical standards, viable social environments, citizens' participation, occupational health and safety, innovative financial models, the improvement of environmental conditions, and the dissemination of knowledge in the academic, technical and social spheres.
- Social agents support and promote actions so that sustainable construction plays an important role, facilitating the sector's restructuring after the crisis.

The main barriers for social dialogue in construction sector are in Spain are:

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- The disappearance of an employer organization (as Confemadera) undermines the functioning of the model, in a so well-defined model of sectoral labour relations.
- The Social Dialogue in the Construction sector constitutes an example of good performance. However, it represents a bipartite social dialogue between the sector's employer and business organisations, with little support by the Public Administration (or the different governmental levels: national, regional, provincial and local).
- It is impossible to make a clear commitment to sustainable construction in the country without governmental support. There is a need to know how to involve and engage the government in the social dialogue necessary to promote sustainable construction.

It is imperative for the organisations participants in this project to create forums for debate and dialogue with the country's different Public Administrations, in order to effect a commitment to Sustainable Construction. The greatest challenge is to verify what governmental authorities are willing to cooperate, and how stable coordination between them can be achieved. It is also essential to create discussion forums in order to foster the cohesive development of Sustainable Construction in Spain.

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5. GUIDELINES FOR SOCIAL DIALOGUE IN SUSTAINABLE CONSTRUCTION

5.1 Tools to bolster social dialogue

Social partners play a dual role in the development of sustainable construction, both through their participation at a technical level in the legislative tools and technical codes that define it, and by guaranteeing respect for ethical standards, socially viable environments, citizen participation, occupational safety and health, etc.

One issue that is affecting the general collective bargaining system in Spain and in other countries is a clear effort to decentralise it, transferring it from the national/industry scope to businesses.⁵ The problem is that greater flexibility may undermine suitable working conditions for workers. In addition, it could lead to the results of lower-level negotiations deviating unfavourably from the protection afforded by higher-level collective agreements, or even existing legislation. Good bipartite social dialogue practices in Spain have allayed the negative effects of the decentralisation of collective bargaining in some sectors.

This move to undercut collective bargaining has the effect of reconfiguring whole areas of the European social model - labour law, collective bargaining, social dialogue, wage formation systems, etc. - which had been effective during the crisis in preventing the deterioration of the economy and the labour market. In fact, the countries experiencing the lowest unemployment rates in the wake of the crisis are those with the strongest labour relations and collective bargaining associations.⁶

In Spain, bipartite social dialogue (between employers and trade unions) is highly developed, but there are almost no areas of social dialogue with the Public Administrations, as there is practically no forum for social dialogue at the national level between the government and Construction-sector employer associations and trade unions.

⁵ La crisis y las reformas de las legislaciones laborales nacionales —Un ejercicio de análisis. (The Crisis and the National Labour Law Reforms - A Mapping Exercise). Stefan Clauwaert and Isabelle Schömann. Instituto Sindical Europeo. (European Trade Union Institute) 2012. Available at: <https://www.etui.org/Publications2/Working-Papers/The-crisis-and-national-labour-law-reforms-a-mapping-exercise>

⁶Source: The Euro crisis and its impact on national and European social policies. Christophe Degryse, Maria Jepsen and Philippe Pochet. 2013. ETUI (European Trade Union Institute). Available at: <http://www.etui.org/Publications2/Working-Papers/The-Euro-crisis-and-its-impact-on-national-and-European-social-policies>

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There have been positive efforts involving tripartite social dialogue, which have addressed good practices for sustainable construction in Spain, although only one of them is still active. The employer and union organisations participating in this project believe that it is impossible to make a clear commitment to sustainable construction in the country without Public Administration support. The difficulty lies in engaging the Administration in social dialogue for sustainable construction.

It is imperative for these organisations to create forums for debate and dialogue with the country's different Public Administrations to bring about a commitment to sustainable construction. It is also necessary to overcome the challenge of administrative decentralisation, as social dialogue at sub-national levels features limitations. One alternative is the use of public-private partnerships as an instrument.⁷ However, knowledge of municipal social dialogue is still in its infancy, and further research is needed.

As for bipartite social dialogue, it is a strong point in the case of Spain. As a good bipartite social dialogue practice in Spain we can cite the creation of joint industry entities. At present there are three sectors (Construction, Wood and Cement) that have created a *Fundación Laboral*, charged with specific collective bargaining efforts. This is a model that is being replicated in other productive sectors of our country, as it is considered a useful element in the democratisation of employee relations.

In conclusion, bipartite Social Dialogue in the Construction sector is an example of a sound practice, but sustainable construction receives little support from the Public Administration (or the different governments: national, regional, provincial and local).

5.2 Scope of action

5.2.1 Policies and legal framework

As for the regulatory field, in Spain there is a wide range of national, regional, provincial and local regulations in various areas that it would be very difficult to comprehensively enumerate. However, the organisations participating in this project have underscored the need to evaluate all the regulations on sustainable construction that we have in Spain, and not only to verify whether they are complied with or not.

⁷Source: The Construction Action Programme of the International Labour Office – A View of On-going Implementation and Implications for Research. Edmundo Werna. 2006. Available at: [http://web.usm.my/jcdc/vol11_1_2006/4_Edmundo%20Werna\(p.53-72\).pdf](http://web.usm.my/jcdc/vol11_1_2006/4_Edmundo%20Werna(p.53-72).pdf)

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In Spain there is a Sustainable Economy Strategy and Sustainable Economy Law. However, according to an ESC (Economic and Social Committee) statement analysing the latter, the development of the growth pattern's social dimension, which the Law aims to promote, is not addressed; no mention is made of promoting quality employment, equal opportunities or social cohesion; it does not establish strategies or measures to achieve long-term social sustainability; nothing is specified about waste management or water resources; and the sustainability of the urban and rural environment is not covered, including dimensions such as social cohesion and emission reduction.

The Government, meanwhile, has proposed a Climate Change and Energy Transition Law, whose main objective is to facilitate Spain's compliance with its international and European commitments regarding climate change and energy. Debate has already begun in this regard, but the Alianza por el Clima (Alliance for the Climate), a coalition of more than 400 environmental, union and civic organisations that have begun to discuss the Law, have been very critical of the participatory process to approve this Law.

The Government has also proposed the development of a strategy for decarbonisation by 2050 through a Roadmap of the various sectors involved, through 2030, and the promotion of Climate Projects and the Environmental Promotion Plans. These measures have not yet materialized.

As for the Circular Economy, the Government has promised the development of a Circular Economy strategy for Spain. Within this strategy the development a Circular Economy Law seems viable, but nothing has materialised to date.

Meanwhile, as a good practice in Spain there is the figure of the delegate for the environment and the environmental commission, a holder of rights and obligations regarding environmental matters at the company or workplace, and a member of the company's board. Falling within his or her purview is information, guidance, inspection and the monitoring of compliance with environmental obligations, proposals for the adoption of measures to prevent environmental risks, etc.

Another example of good environmental practices that exists in the Construction sector is the II Recovery Agreement for the Spanish Cement Sector (2014), whose objective is collaboration in the development of initiatives that promote the sustainable use of resources, and the protection of the environment and people's health, thereby augmenting the competitiveness of the Spanish cement sector.

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By way of conclusion, it can be said that the political context acts as a major driver of initiatives geared towards a more sustainable economy. Social dialogue and projects promoted by social partners can complement national or international policies.

5.2.2 Work conditions and new skills

Social Dialogue, in addition to the democratic basis on which labour relations are based, is an important tool for achieving more and better social cohesion and endowing workers with rights. Social Concertation is understood not as a mere forum through which to consult organisations representing workers, but one to produce contractual power and furnish said associations with real clout.

It is necessary to add to the concept of sustainable construction that of social sustainability, favouring housing models with shared spaces that facilitate the life of users regardless of their situations and social and/or economic needs – which could have been promoted by taking into account that rehabilitation and refurbishment constitutes the subsector that has seen the smallest declines in overall activity and, in addition, is one of those boasting the greatest potential to reactivate activity, given the demographic evolution in Spain and the need to adapt to the new environmental, energy and social requirements impacting housing and its facilities.

In addition, the fact that some companies are well positioned in some technologies that will act as drivers of the sustainable construction market in the coming years (such as measurement and control systems, water treatment and supply, solar energy, the recovery of thermal and natural resources, and sustainable and accessible building and rehabilitation), opens up a range of possibilities, including the generation of new jobs in both environment-related sectors and emerging activities in which our positions are more tenuous, such as ecodesigns for products and material efficiency.

The synergies of these initiatives to improve and modify the current residential model, based on a hypermarketed one, should feature important synergies with the strategy for the development of residential and community social services (currently scarce) to improve quality of life for all people, in all their diversity, in community settings.

From this perspective, training for sector workers is vital, as is the recognition and certification of this training being carried out in Spain. This should be an area in which to continue making a commitment, along with retraining and bolstering the employability of long-term unemployed workers.

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The policy of promoting the evaluation and accreditation of skills across all professional categories can greatly enhance processes for the orientation and relocation of people who lose their jobs.

Social dialogue can facilitate the improvement of training in sustainable construction issues: many workers can receive training related to sustainable construction methods, with the resultant positive effects on employment and efficiency in the use of resources. Both companies and trade unions are interested in ensuring that employees have the appropriate qualifications to carry out their work in accordance with the needs of companies, and that they are able to comply with the most advanced European standards governing sustainable construction.

5.2.3 Technology, Knowledge, Production Process Innovation

Despite some advances in recent years, the data on R&D in Spain shows that it plays a lesser role in construction activities than it does in other areas in the economy. The materials industry and others related to it boast better figures, though there is still much room for improvement.

These indicators vary according to the company's size, with more innovative companies and those with the most intense innovation being those with more than 250 workers.

The optimum process for the internationalisation of the Spanish construction industry, however, would not be viable without the kind of great technological capacity and high productivity capable of sustaining that position in competitive markets. In this regard we can speak of signs of a positive change in the sector in terms of innovation.

The factors that may be limiting greater innovative intensity are structural, associated with the characteristics of the sector and the very nature of the activity.

Refurbishment and energy efficiency constitute a unique opportunity to promote R&D in the industries that supply construction-related products and services. Social dialogue with Public Administrations should play an important role in this regard.

It is also very important to establish where the sector is and the direction it should move in: the analysis of the Life Cycle and Environmental Product Declarations.

The evaluation of products and services from a life cycle perspective is a growing demand by both public and private clients. The signals given by legislation, such as that of the European Commission, and by private clients, indicate that communications regarding

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environmental performance based on life cycle assessments are now a necessary tool for organisations seeking to compete in increasingly demanding markets.

Environmental Product Declarations (EPDs), meanwhile, represent a benchmark for public and private purchasing at the global level.

The European Commission is moving in the direction of including environmental aspects based on Life Cycle Assessments to establish the purchasing criteria in the Single Market initiative for Green Products, featuring several Product Environmental Footprint (PEF) pilot projects. The PEF methodology uses an approach similar to that of the EPDs (Environmental Product Declarations), based on the same ISO 14025 standard, international LCA (Life Cycle Assessment) standards, and the International Reference Life Cycle Data System - ILCD) published by the Joint Research Centre (or JRC).

As for the cement industry, in recent years Spain has made major R&D investments, turning out different cements of high quality and delivering major added value, this being internationally recognized. A very important role in this regard has been played by the IECA (Spanish Institute of Cement and its Applications), which has published the EPDs of national manufacturers' cements.

5.2.4 Cultural dimension

For social dialogue to be successful, those involved in it must possess social dialogue structures through which they share objectives and vision of what sustainable construction should be. The cultural dimension directly influences these stable structures.

Existing bipartite social dialogue instruments should reserve a place in their work programmes for sustainable construction, reaching agreements on policies, measures, initiatives and specific actions that allow for the real development of such construction. For this, it is imperative that bipartite social dialogue be expanded to *tripartite* social dialogue (including Public Administrations). Thanks to this transformation, certain tools could be created to foster cooperation by all parties.

Awareness-raising should play a key role as a precondition for the achievement of these co-operation agreements, as sharing the same concerns, perceiving and interpreting issues related to sustainable construction in the same way, and being willing to contribute to environmental protection constitute important preconditions for the achievement of responsive social dialogue.

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It is crucial to share the same vision of the need to adopt sustainable construction policies in the country and to raise the awareness of the workers and agents involved in the expansion of the environmental culture, all so that social dialogue works.

It is also necessary to assess the ecological and social impact of any measure to be taken. It is difficult to measure the success of sustainable construction initiatives with regard to ecological and social effects, such that the effective tracking of initiatives to improve sustainable construction is needed in order to gauge their contribution to the achievement of objectives, such as the EU's 20-20-20, and the improvement of working conditions and competitiveness. This monitoring will also facilitate the early detection, for example, of possible conflicts between environmental and social objectives, and will allow for the introduction of appropriate changes in order to achieve more satisfactory results for all.

5.3. Guidelines for Social Dialogue at the European level

In order to firmly institute strong sustainable construction activity in the EU it is necessary to establish an institutionalised Tripartite Social Dialogue model based on a dedication to permanence and that allows for the definition, coordination and monitoring of the initiatives to be undertaken in favour of sustainable construction. There also must be forums for debate and dialogue to achieve a European commitment to sustainable construction.

This Social Dialogue must be entirely dedicated to:

- Promoting public investment in sustainable construction, which will boost its growth and have an immediate impact on economic activity and employment, encouraging the creation of new, specialised jobs and a vocational training system in line with the new needs in this regard.
- Bolstering mechanisms for public-private collaboration by facilitating legislation governing contracting and the raising of capital that is attractive to investors
- Implementing a coordinated housing policy adapted to people's needs and that complies with European legislation.
- Rendering the public policies of EU member countries more coherent with reference to urban planning, housing and land.
- Promoting R&D into both products and processes in the EU that improve competitiveness and represent a commitment to sustainable construction models. The creation of forums or industrial observatories on sustainable construction would be a good working tool.

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- Bringing about a cultural change to make sustainable construction a real demand in European society. Consumers need to be encouraged to choose sustainable construction in their decisions.

The success of these efforts will depend, to a large extent, on the existence of a regulatory framework that truly guarantees legal security, and a fiscal policy that encourages and favours the development of sustainable construction.

Employers' associations and trade union organisations can also play an important role in the development of sustainable construction by reaching agreements on vocational training, occupational hazard prevention, and the promotion of employment. Social dialogue and projects promoted by social partners can also complement European policies on sustainable construction.

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ANNEX – COMPARATIVE ANALYSIS ON COUNTRY REPORTS

Background: INSTITUTIONAL LEVEL/LAWS AND PUBLIC STRATEGIES				
 <ul style="list-style-type: none"> • Great importance of the adoption of EU Directives and policies • Fragmentation of responsibilities • Lack of guidance and coordination of the policies • National Energetic Strategy (EE): raise of minimum standards/ energetic performance of buildings • Lack of a National Strategy on the efficient use of resources • Energetic certification of buildings • Incentives: • Thermal Bill Decree (EE and RE) • White Certificates System TEE (EE for big energy distributors) • Tax credit for energetic requalification of buildings • Specially-made initiatives: urban restructuring, school and public constructions, big infrastructures • High diversification at local level (on EE of buildings and energetic certification) • New Code for Tenders including mandatory environmental standards (2016) 	 <ul style="list-style-type: none"> • Long-term strategies (from EnEG 1976) • 2016 Federal sustainability strategy (from 2002) • National Legislation: Acts on Renewable Energy Sources (EEG) and Conservation (EnEg) + • Energy Saving (ENEV, 2002)/ certification of sustainable buildings (DGNB system) • “Resource efficiency” policies (2012-2016) • Ordinance on Hazardous Substances (2004) • Incentives and programs (KfW funding programme among the oldest and most well-know ones) 	 <ul style="list-style-type: none"> • Great importance of the adoption of EU Directives and policies (Europe 20-20-20 targets) • 3° National Renewable Energy Action Plan (2014) • Federal and regional Initiatives on EE (certifications, allowances, tax credits, d-base of building materials....) • Training, economy, employment and energy policies 	 <ul style="list-style-type: none"> • Great importance of the adoption of EU Directives and policies (Europe 20-20-20 targets) • More focus on the environmental dimension of economic growth than on the social one • Poor coordination of the legal framework at different PA levels/initiatives/key-actors supporting sustainable construction • Excessive regulatory production on sustainable construction, as a consequence of the poor coordination (mentioned above) • Few state support/initiatives fostering sustainable construction • Initiatives on energy savings, efficiency, diversification • Diversification at regional and local levels 	 <ul style="list-style-type: none"> • Delayed adoption of EU Directives on EEO buildings: • - Construction Law (July 1994) • - Spatial Development Act (March 2003) • - Minister of infrastructures and Development (MID) Regulation on technical conditions for buildings and their location (Journal of Laws 2002, n.75, it.690) • On buildings’ energy performance: • - Act on Energy performance of buildings (29/8/2014) • - Ministry of Infrastructure and Development (MID) Regulations on the methodology to define EBP and energy performance certificates (27/2/2015); on the methodology and scope of verification of energy performance certificates and protocols for inspection of heating and air conditioning systems (17/2/2015); on protocols of control on heating and air conditioning systems (17/2/2015) • National Plan to increase low energy consumption buildings (July 2015) • State loans to fund thermal insulation of existing multi-family houses (Bank Gospodarstwa Krajowego) • Lack of funds to support legal regulations in GB • Current debate on raising standards and introducing penalties due to the effects of building heating on air pollution

ANNEX – COMPARATIVE ANALYSIS ON COUNTRY REPORTS

Background: INSTITUTIONAL LEVEL/LAWS AND PUBLIC STRATEGIES	
 CONVERGENCES 	 DIVERGENCES 
<ul style="list-style-type: none"> • Great importance of the adoption of EU Directives and policies • Focus on EE/energy saving issues • Use of incentives (I-B- S) • Importance of certification systems (I-G-B-S-P) • Diversification at regional and local levels (I-B–S-G) • Integrated approach to sustainable building (not only EE, but also urban regeneration, territorial safety and planning) in I - G – S fosters a smart city approach 	<ul style="list-style-type: none"> • Long/short term strategies • Policies about specific issues • Poor coordination (I-S) in relationship between national and local policies • Training and qualification policies • Decreasing tendency in the use of incentives in G

ANNEX – COMPARATIVE ANALYSIS ON COUNTRY REPORTS

Background: ECONOMY AND EMPLOYMENT				
 <ul style="list-style-type: none"> • Decrease in employment, production, profit, companies (with a light recovery in 2015) • Fragmentation of companies • Very small dimension of the companies (96% with <10 employees) • Growth of undeclared work • Stability of the technology systems in buildings • Reduction of the effects of the crisis due to EE interventions • Need for new competencies • Lack of high skilled workers • Inadequate educational/training system • Changes in demand in the market: wood building increase and technology systems 	 <ul style="list-style-type: none"> • Stable sector, with light increases (also prospective) • Construction sector as agent of economic growth • Prevalence of small and micro enterprises (75%) • Shortage of skilled construction workers and high-seniority • Workers shortage in near future • Need for the certification of workers' competences • Poor appeal of the sector for workers • Low attention to clients (information and culture) 	 <ul style="list-style-type: none"> • Greatest potential for EE in existing buildings (high consumption: 72% more than EU-25 average) • Greater interest in GB on behalf of installation companies • Prevalence of small and micro enterprises • Competitiveness among producers of construction materials based on prices instead of innovation • Poor aptitude towards innovation • Poor demand in the market for quality in goods and services • Introduction of automation and prefabricated materials in the construction process • High turn-over and shortage of qualified workers • Decrease in workers (10%) • Coordination of training activities at federal level (Constructiv) • Updated profiles and definition of new competences (2011-2014) • Diversifies markets according to company typology 	 <ul style="list-style-type: none"> • Activity and employment levels below normal ones • Collapse of employment (- 73%), companies, economic activity, consumes and cement production (similar levels in the '60s) • Activities on existing buildings got the fewer decrease within the sector • Need for administrative support and public investments • High decrease of innovation rates (lower than in other sectors) • Fragmented and heterogeneous sector • Majority of small and micro companies and self-employment • Poor demand in the market of energetic restructuring/sustainable construction • Availability and use of European Funds • Need for workers' training and qualification depending on branch or activity in construction sector • Lack of interest in training of the workers of the sector at environmental level (low awareness) • The important professionalization of the sector is not homologated in official formation (training) • Loss of technological knowledge/skilled workers due to jobs decrease • Administrative barriers against the mobility of Spanish workers 	 <ul style="list-style-type: none"> • 20% decrease in the sector from August 2015 to 2016 • Slow and gradual improvements in buildings' EE (natural gas and coal main source of energy in single-family buildings) • Higher costs for EF constructions than for traditional ones • New construction projects carried out within new standards but with no regard to their future development • Fragmentation of the sector (96% companies with <9 employees) • Chronic shortage of qualified specialists (due to the unstable labor market and higher salaries abroad) • 200.000 specialized workers in other MSs and 260.000 immigrants in the sector (98% from Ukraina) • Formal training fits sustainability issues in GB but labor market workers gained informally their competences

ANNEX – COMPARATIVE ANALYSIS ON COUNTRY REPORTS

Background: ECONOMY AND EMPLOYMENT	
 CONVERGENCES 	 DIVERGENCES 
<ul style="list-style-type: none"> • Effects of the economic crisis (P) – slow recovery (I-S-B) • More opportunities on interventions on existing buildings (I-S-B) • Prospective growth of the sector within the sustainability framework (I-G-S-B) • Majority of small/micro companies/fragmentation (I-G-B-S-P) • Irregular/undeclared work in I - G and S (as a consequence of crisis) • More focus of the companies on costs instead of on quality of goods/services (I-G-B) due to rare demand services (S) • Diversified markets for different groups of companies (eg. technological systems in I-B) • Introduction of innovation (I – G - B); notwithstanding the larger decrease in technological innovation (-75%) S exhibits feeble signs of positive change in the sector • Lack of skilled workers (G-B-I-S-P) • Ongoing surveys and identification of profiles and innovative competences (I-B-G-S) • Need for upgrading workers’ competences (I-B-S- G-P) 	<ul style="list-style-type: none"> • Stable sector only in Germany • Beginning of new industrialization process (B-I-S) • 200.00 Skilled workers migrated in other MSs, 260.000 qualified workers (mainly from Ukraina) arrived in P

ANNEX – COMPARATIVE ANALYSIS ON COUNTRY REPORTS

Background: R&D, TECHNOLOGY AND INNOVATION				
 <ul style="list-style-type: none"> • Prospective new phase/industrial cycle related to technology and innovation • Introduction of prefabricated materials/launch of industrialization in the sector • More focus on costs than on quality of constructions • Establishment of the Observatory on Sustainability and Innovation in Building (OISE) from 2011 			 <ul style="list-style-type: none"> • Data on R & D show a lower weight of these activities in the construction of those that have throughout the economy • The intramural R & D activity of companies in the construction sector is less frequent than that of the total productive sectors • The main indicators of technological innovation of companies in Spain point to a backward position in the construction sector. • However, both the weight of innovative firms and the intensity of innovation turn out to be greater in the business segment of more than 250 workers. • Nevertheless, the process of internationalization of the Spanish construction industry causes signs of a positive trend change in the sector in terms of innovation. • The factors that may be limiting a greater innovative intensity are basically of a structural nature, associated with the characteristics of the sector and the very nature of the activity • There is ample room for improvement of innovative activity in construction 	 <ul style="list-style-type: none"> • High level ecological and technological standards in the manufacturing of construction materials and products • Sectoral small and micro-companies lack the resources to invest in development, materials and technology

ANNEX – COMPARATIVE ANALYSIS ON COUNTRY REPORTS

Background: R&D, TECHNOLOGY AND INNOVATION	
 CONVERGENCES 	 DIVERGENCES 
<ul style="list-style-type: none"> • Small dimension of companies as a limit to innovation (S-I-P) • Orientation towards industrialization (I) and innovation (S) 	<ul style="list-style-type: none"> • High level ecological and technological standards in the manufacturing of construction materials and products (P) • Establishment of the Observatory on Sustainability and Innovation in Building (OISE) from 2011 (I)

ANNEX – COMPARATIVE ANALYSIS ON COUNTRY REPORTS

Background: SOCIAL DIALOGUE				
 <ul style="list-style-type: none"> • Sound SD system, present at all levels • Tripartite structure of SD in GB with the contribution of environmental organizations • Cooperation among trade unions • Signing of the Manifesto of the General States of Construction on behalf of the social partners (2012) • Strengthening of the bilateral systems • Bilateral tools for training and social protection of workers of the construction sector • Agreements at territorial level • Establishment of the National Observatory for Quality Reconstruction in the Areas of Central Italy interested by earthquake (2017) 	 <ul style="list-style-type: none"> • Sound SD system, present at all levels • Tripartite structure of SD in GB • DGB (German trade unions confederation) Manifesto in 1996 • IG BAU - Alliance for Job and Environment with civil society organizations (from 1998) • German Council for Sustainable Development (from 2001) • Agreements among social partners and legal framework • Unitary trade unions and strong sector-based associations 	 <ul style="list-style-type: none"> • Sound SD system, present at all levels (unions and employers) • Bilateral structure of SD in GB (unions and employers) • Permanent Joint industrial committee for the construction industry • Fvb-Ffc Constructiv (fund for vocation training) within the Joint Industrial Committee • Participation in the Social Protection Fund • Partnerships on training at national and regional levels 	 <ul style="list-style-type: none"> • Well structured model of industrial relations in the sector (from 1998) • Lack of government and institutions in social dialogue: lack of tripartite social dialogue (good social dialogue between unions and employers associations). • Permanent agreements concerning industrial relations at national, regional, local level • Bilateral organizations (Foundations for construction, cement, wood) • Bilateral Forum on the integrated cycle of construction from 2013 • Good practice of tripartite SD (concluded!): Industrial Observatory on the construction sector (2009-2011) 	 <ul style="list-style-type: none"> • Weak SD system (National Council and Voivodship Councils for SD) • Lack of a tripartite dialogue • Few and decreasing collective agreements (in general) • Poor focus of social partners on environmental issues in the economy and sustainable development at national level • The Tripartite Commission on Building and Municipal Services in the sector constitutes the main formal forum for SD (also in the field of health and safety in construction) • Joint social partners' initiatives on professional education for SB at sectoral level (Competences in the Construction Industry from 2017 and activities on the Sectoral Qualification Framework) • Lack of SD focusing on GB at company level

ANNEX – COMPARATIVE ANALYSIS ON COUNTRY REPORTS

Background: SOCIAL DIALOGUE	
 CONVERGENCES 	 DIVERGENCES 
<ul style="list-style-type: none"> • Sound SD system, present at all levels (I-G-B-S) • Tripartite (I – G) or bilateral (B) structure of SD in GB • Permanent agreements • Partnerships among actors belonging to different sectors (eg.: industrial or waste management sectors) • Wide range of joint organizations involving SD actors (in Forum, observatories, committees, foundations) in different activities (for instance in training) • Cohesion among social partners in the sector (G – S – B) - only more recently in I 	<ul style="list-style-type: none"> • Weak SD system and poor trilateral dialogue on GB in P • Lack of institutions in SD in GB in I , B and especially S (with the exception of G) • Long tradition of SD with civil society organizations (green movement in politics) in Germany • Each country presents partially different structures • Establishment of the National Observatory for Quality Reconstruction in the Areas of Central Italy interested by earthquake (2017) - I

ANNEX – COMPARATIVE ANALYSIS ON COUNTRY REPORTS

Social dialogue and green building – INSTITUTIONAL AND POLICIES LEVEL									
									
D	L	D	L	D	L	D	L	D	L
Adoption of European policies Management of territorial emergencies (securing activities) Energetic policies Incentives	Lack of a defined position on GB on behalf of government Lack of framework policies Lack of coordination between National and European policies on GB Lack of coordination between National and local policies on GB Lack of medium and long-term planning Discontinuity of incentives	National Energy Acts Certification Compliance to federal laws	Decrease of incentives	Adoption of European policies	Diversification among regions Discontinuity of the incentives	Adoption of European policies (PEF) National Strategy and Law on sustainable economy	Lack of coordination among the actors of the policies Lack of national policies Lack of an integrated approach to urban regeneration/resource management	Government actions implementing European regulations	Small amount of significant economic incentives Low propensity to invest in EE in buildings

ANNEX – COMPARATIVE ANALYSIS ON COUNTRY REPORTS

Social dialogue and green building – INSTITUTIONAL AND POLICIES LEVEL	
 CONVERGENCES 	 DIVERGENCES 
<ul style="list-style-type: none"> • Laws and policies at different levels • Limited coordination among different levels • Main driver represented by compliance with EU policies • Lack of National policies directly fostering SC in I-S-B (present in G) • Discontinuity of incentives (I-B) - orientation towards reducing some incentives (G -S) – small amount of significant economic incentives (P) 	<ul style="list-style-type: none"> • Different needs depending on the nature of the building stocks (old/new, level of insulation, etc.) and on environmental factors (eg: earthquake safety in I) • Germany presents greater coordination among different PA levels and exhibits a driving effect compared with EU • Significance of building securing issues in Italy (due to recent earthquake events)

ANNEX – COMPARATIVE ANALYSIS ON COUNTRY REPORTS

Social dialogue and green building – ECONOMY AND EMPLOYMENT									
									
D	L	D	L	D	L	D	L	D	L
<p>Requirements for territorial security</p> <p>CSR</p> <p>Information on good practices</p> <p>Training and certification of companies</p> <p>Compliance with European policies</p> <p>European Funds</p> <p>Practices of technological and organizational innovation in the sector</p>	<p>Fragmentation of the sector</p> <p>Need for workers' qualification</p> <p>Inadequacy of current training offer</p> <p>Poor information on BIM models</p>	<p>Energy saving demands</p> <p>Increase in legal requirements</p> <p>Certification</p> <p>European Qualification Framework</p> <p>Technological R&D on heating/ventilation/EE/lighting/renewable energy sources</p> <p>BAU trade Fair (knowledge management/dissipation)</p> <p>Further enhancement of the educational dual system</p>	<p>Knowledge gap among companies and workers</p> <p>Demand for partial building restructuring</p> <p>Economic interests in potential conflict with environmental ones</p> <p>Poor reliability of the consultancy market for the sector</p>	<p>Identification of new competences for updated profiles</p> <p>Need to match "performance standards" instead of "best efforts"</p> <p>Awareness raising activities targeting executors and contractors</p> <p>Symbolic role of public commitment</p> <p>Need for more qualification and continuous employability of workers</p>	<p>Rapidity of changes in competence needs</p> <p>Poor focus on the operational dimension of training activities delivered through partnerships</p>	<p>Past investments in innovation</p> <p>Focus on LCA applied to environmental certification of goods and services</p> <p>Public Private Partnership (PPP)</p>	<p>Decrease in public investments</p> <p>Lack of credit opportunities</p> <p>Fragmentation of companies</p> <p>Poor demand on behalf of clients</p> <p>Willingness to invest only if "requested"</p> <p>Exit of qualified workers from the market</p> <p>Poor awareness about opportunities for GB delivered by BIM models</p>	<p>Common willingness of social partners to reduce the informal economy</p> <p>Common interest of social partners in reorganizing the labor-market</p> <p>Common interest of social partners in filling the gap in the demand of high-qualified specialists</p> <p>Joint social partners' initiatives on professional education for SB at sectoral level (Competences in the Construction Industry from 2017 and activities on the Sectoral Qualification Framework)</p>	<p>Fragmented structure of the construction industry</p>

ANNEX – COMPARATIVE ANALYSIS ON COUNTRY REPORTS

Social dialogue and green building – ECONOMY AND EMPLOYMENT	
 CONVERGENCES 	 DIVERGENCES 
<p>Drivers:</p> <ul style="list-style-type: none"> -Compliance to legal framework -Availability to innovate -Certifications (I-G-S) -Demand for more qualifications and competences of workers (I-B-P) <p>Barriers:</p> <ul style="list-style-type: none"> -Fragmentation/small dimension of companies (I-S-P) - Lack of competences among workers and companies 	<ul style="list-style-type: none"> • In some cases there is a capitalization of past innovations • R&D activities: poor relations among key-actors (I-S-P); ongoing relations (G - B) • Sound and long-term dual system (education/companies) in G • Low attitude to undertake integrated restructuring interventions in buildings due to costs (G – S) • Information available on good practices in SD on GB (I) • Lack of information on BIM model (I-S) • Further enhancement of the educational dual system in G

ANNEX – COMPARATIVE ANALYSIS ON COUNTRY REPORTS

Social dialogue and green building – SOCIAL DIALOGUE

Social dialogue and green building – SOCIAL DIALOGUE									
									
D	L	D	L	D	L	D	L	D	L
Involvement of national actors on international debate on GE and sustainable development	Fragmented and de-structured building sector (lack of a critical mass)	DGB Manifesto (1996)	Lack of a shared definition of green workplaces and green economy	Tripartite initiatives at regional/local level	Lack of arenas/tables/platforms to debate among SD actors and other professionals of the enlarged supply chain	Good performance of SD in the construction sector	Lack of state commitment (currently absent) on SD on SC	The Tripartite Commission on Building and Municipal Services in the sector as main formal forum for SD	The law is not conducive to conclude binding collective bargaining
Tripartite alliance initiatives fostering sustainable development	Absence of a common position among employers associations	Representativeness of trade union and employers organizations	Few companies having workers' councils (thus nurturing the poor appeal of the sector)	Partnerships to involve different key-actors in the field of green competences	Difficulty in considering white collars as a target group of policies	Agreements among employers and trade unions (2014 Oficemen – MCA UGT and FECOMA CCOO)	Lack of coordination among employers and trade unions with the different levels of PA	Fragmentation of the industry	Low level of organization of employers and trade unions in small firms
Dialogue on the building sector	Detachment and lack of information on SD/GB between national and local level	Social partners' common vision on some key issues	Difficulty to involve other sectors in SD on GB	Different sectoral knowledge centres to work on sustainable building		Industrial Observatory on the sector (good experience of already concluded tripartite SD)	Lack of platforms/tables/arenas for debate among PA actors	Common willingness of social partners to reduce the informal market, to reorganize the labor-market and to supply for high qualified specialists in the sector	Poor representativeness of employers' organizations
Relevance of training activities in SD in GB	Poor participation of green companies in controversies between social partners	Tripartite initiatives at regional/local level		Relevance of training activities in SD on GB			Feeble bonds among universities, technical institutes and companies (in general)		Few workers associated to trade unions
Participation in European projects	Lack of focus on health and safety in GB	Relevance of training activities in SD in GB							
Local initiatives on: training, information, buildings qualification, urban planning and regeneration	Difficulty in considering white collars as a target group of policies	Relevance of health and safety at work							
Bilateral entities	Difficulty to involve other sectors in SD on GB								
Workplace safety and health issues									
European corporate committees									

ANNEX – COMPARATIVE ANALYSIS ON COUNTRY REPORTS

Social dialogue and green building – SOCIAL DIALOGUE	
 CONVERGENCES 	 DIVERGENCES 
<ul style="list-style-type: none"> • Partnerships among different actors • Structured forms of interaction • Need to focus on health and safety in GB (G-B-I) • Lack of arenas to debate with government/institutions (I-B-S.P) • Relevance of training activities in SD on GB (I-G-B-P) • Crucial role of regional/local initiatives accompanying national ones 	<ul style="list-style-type: none"> • Poor representativeness of employers’ organizations (P) • Difficulties in considering white collars a target group of policies (I-B)

ANNEX – COMPARATIVE ANALYSIS ON COUNTRY REPORTS

Social dialogue and green building – SOCIAL AND CULTURAL ASPECTS									
									
D	L	D	L	D	L	D	L	D	L
	Poor knowledge and information on real advantages	Long time presence of a strong green movement Clients' expectations on competences of the workers of the sector	Limited local and immediate visibility of the consequences of not-sustainable behaviors				Workers polarization (high e low skilled) Scarce linguistic competences of migrant workers Myths/false representations about construction materials Poor environmental awareness about potentialities for SC of BIM models Poor general ecological awareness		Low awareness on advantages among owners and builders

ANNEX – COMPARATIVE ANALYSIS ON COUNTRY REPORTS

Social dialogue and green building – SOCIAL AND CULTURAL ASPECTS	
 CONVERGENCES 	 DIVERGENCES 
<ul style="list-style-type: none">• Poor information among citizens on the concrete advantages of GB (I-S-P)	<ul style="list-style-type: none">• Long time presence of a strong green movement in G



European Guidelines on Social Dialogue for Sustainable Construction

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PREMISE

It is necessary to strengthen social dialogue in the construction sector in order to address the economic, social and environmental challenges arising from the transition to a sustainable economy.

Dialogue between the social partners can play a fundamental role in accompanying the reorganisation of production and managing the impact on employment and people's working and living conditions in the transformation to a low-carbon economy; contributing to promote growth based on the efficient use of natural resources, research and innovation in the field of new construction products and processes, as well as the creation of new jobs and the retraining of workers faced with new demands stemming from the ongoing changes, to combat poverty and social exclusion.

The aim of this document is to propose guidelines to help strengthen the role of social dialogue in support of the sustainable transformation of the construction sector at a European level, in the light of the great – but still not fully exploited – potential which social dialogue itself has as a form of governance of the transition to a low-carbon economy (ILO-ITUC, 2016; ETUC, 2017).

To this end, these guidelines are based on some key assumptions:

- **to strengthen the inclusive nature of social dialogue processes** which make it an important tool for the achievement of sustainable development goals, by promoting an enlarged, multistakeholder vision through the involvement of a wide range of players who are potentially the protagonists of social dialogue at national and European level: not only representative groups from the world of work, business and the public institutions, but also the world of experts, environmental organisations and civil society, taking into account, in addition to construction, other sectors and professions connected with the transition to a sustainable economy.

- **to encourage sharing, participation and cooperation** at national and European level between the partner countries in the project through the exchange of information, guidance and experience to ensure, throughout the entire planning process, **reciprocal learning and the dissemination** of successful models and best practices relating to the social dialogue processes in favour of sustainable development in construction.

- **to develop guidelines and suggestions for strengthening social dialogue at national and European level through the direct involvement and collaboration of the players involved in**

social dialogue so that in each partner country in the project they have been listened to and invited to participate actively in the development of the guidelines.

In the light of the above objectives, the creation of European guidelines for strengthening the role of social dialogue in favour of sustainable construction has been based on a path articulated in specific workshops at national and European level that have enabled the exchange of knowledge, and the dissemination and creation of synergies prior to the drawing-up of guidelines. In addition to listening to the players involved regarding the current state of the development of social dialogue and what the obstacles are that need to be overcome and the levers required for its strengthening, participation in the workshops has also made it possible to strengthen the very practices of social dialogue, insofar as the workshops have been conceived as proper operational working groups on social dialogue, called on to share and provide precise guidance on the subject. Once national guidelines were identified on the basis of the specific features of each country involved in the project, the development of the European social dialogue guidelines was based on the comparison between the different experiences in different countries that have allowed a highlighting of convergences and divergences, strengths and weaknesses, and drivers and barriers to the development of a social dialogue for sustainable construction in Europe from the point of view of the experiences of the countries in the BROAD project.

These guidelines, therefore, represent a synthesis of the indications that have matured in the national contexts of the partner countries.

On account of the lack of substantial experience in this area in the construction sector, the proposed guidelines are a first attempt at strengthening the important role that social dialogue can have in the governance of the transition to a low-carbon economy, in an attempt to reduce the lack of information and knowledge that obscures the possibly fruitful link between sustainability and social dialogue.

The guidelines we present below are articulated in **preliminary assumptions**, that is, basic guidelines of a general nature, a **synthesis of the state of social dialogue in construction in the partner countries, conditions and drivers (key points)** for the strengthening of social dialogue at European level, and the **agenda** which describes the areas of priority intervention from the point of view of the national partners.

1. PRELIMINARY ASSUMPTIONS

Sustainable construction is considered a driver of the energy transition, whether as a **requirement** (for example, in terms of the climatic resilience of urban settlements or a reduction in climate-altering emissions), as well as an opportunity to recover from some of the negative effects of the 2008 crisis (for example, those regarding the reduction in employment and number of companies operating in the sector). From this perspective, construction is built around the three **pillars of sustainability** (economic, environmental and social) which are interrelated and of equal importance. Consequently, sustainable construction must be clearly defined in relation to these three dimensions, to be taken into account together, but also, in turn, to be aligned with one another within the **broader and more complex value chain** of the sector.

The path to sustainability for the construction industry is not an easy one. It is necessary to put in place a number of conditions in support of this process, relating to: the political will, a shared understanding, the adequacy of the skills and training of workers, the protection of working conditions, the availability of the necessary resources, an awareness on the part of civil society about what is at stake, and so on. In addition, the **consequences of the transition** (both expected and unexpected) as well as the resulting **risks** have to be identified and monitored (employment vs. digitalisation, workers' health and safety, effectiveness of communications, forms of obstructionism or lack of support because of knowledge gaps, etc).

All these processes and their consequences require a **multilevel governance** of substantial policies and measures in support of sustainable construction, the result of the agreement between all the relevant stakeholders and based on the adoption of a structural and integrated approach (since a linear input-output scheme is not suitable for dealing with their complexity and urgency).

In view of the above, the social partners, governments, environmental organisations and civil society, academia, and research and development institutions share the view that social dialogue – at European, national and local level – can **effectively support the transition to sustainability** in the construction sector **by monitoring its effects**, thanks to its ability to deal with multidimensional conditions, complicated dynamics and the impact of ongoing changes.

According to the ILO 2013, social dialogue includes "all types of negotiation, consultation and exchange of information between government representatives and social partners or between social partners around issues of common concern regarding social and economic policies". Therefore, by its very nature, social dialogue can intervene on the transition towards sustainability of construction both as an **instrument** and as a **form of governance**. In addition to

consolidating the accountability of the various players involved (for example, it is assumed that governments will provide feedback on the follow-up of the agreed measures and initiatives), through the **multistakeholder form** partners in social dialogue can **share their views and influence** the policies or measures that concern them, on the basis of clear and comprehensive shared **information and knowledge**.

2. SOCIAL DIALOGUE FOR SUSTAINABLE BUILDING IN THE COUNTRIES OF THE PROJECT

The success of social dialogue largely depends on the **characteristics of the context** in which it is conducted. Beyond what is being implemented at European level, improvements in the transition towards sustainable construction also have to rely heavily on the specificities and strengths of **general industrial relations regimes** at national and cross-sectoral levels. As far as the construction sector is concerned, social dialogue is currently characterised by a high level of fragmentation, low trade union density and a highly polarised coverage of collective bargaining throughout the Member States (Eurofound 2015).

The state of social dialogue in the countries represented in BROAD appears to be differentiated. If the tripartite system is present in general, in all countries (albeit displaying a certain weakness in Poland), the field of sustainable construction shows **very substantial differences**. In Italy, Belgium and Spain, tripartite social dialogue sees **a very limited participation by the institutional component**, partially compensated for in Italy and Belgium at territorial level. An absence of relations with the government and the various levels of the PA is recorded above all in Spain where, nevertheless, the activities carried out between 2009 and 2011 by the Industrial Observatory of the construction sector represented an instance of efficacious tripartite social dialogue. In the three countries, the lack of involvement of the institutional component is accompanied by a **good interaction between the social partners** around sustainable construction. In Italy, for example, bilateral bodies for training, workplace safety and social protection are very strong (think of the widespread activity throughout the country of the Formedil building schools), as well as in Belgium, where the fund for professional training, Constructiv, has been established for many years by the Joint Industrial Committee on construction; in Spain too, the Fundacion Laboral, a joint industrial body promoted intersectorally (in fact it deals with the construction, wood and cement sectors), is currently being proposed as a successful model to be replicated in other areas.

The positions of Germany and Poland are very different with respect to the situation in the three countries described above. In fact, Germany has for many years had an **effective and consolidated system** of tripartite social dialogue on green building and sustainability, while in Poland, the institutions display **very little propensity to social dialogue**, and the social partners

too exhibit a **low level of awareness** about environmental issues in the economy and sustainable development. In this framework, the unions and employers in Poland seem to have little influence on the process of transition towards sustainable construction, especially at a national level. On the other hand, it is worth noting the joint initiative of the Construction Industry Sector Competences Council, which has been active since 2017, on vocational training, which will focus its attention on new qualifications, specialisations and construction techniques needed for sustainable construction. At the regional level, the problem of sustainable construction is taken into account by some Regional Development Strategies that negotiate and sign also trade unions and employers' organizations.

With regard to the extension of dialogue to other stakeholders, it needs to be underlined how both Italy and Germany show an **extended multistakeholder composition**. In the first case, for a number of years, environmental organisations and citizens' groups, professional orders, universities and experts have been involved with the social partners and institutions, which in fact have already created forms of social dialogue on sustainable construction at national level (such as, for example, through the establishment of the National Observatory for the Quality of Reconstruction in 2017, following the earthquakes in Central Italy in 2016), as well as, especially, locally. Germany has a long tradition of dialogue with the organisations of civil society (1998 saw the establishment of the Alliance for Jobs and the Environment promoted by the unions together with the Ministry of the Environment, Nature Conservation and Nuclear Safety BMU and environmental NGOs), also thanks to the presence of the green movement in politics.

Intersectorality also promotes dialogue between social partners and other stakeholders. In Spain, for example, the Bilateral Forum on the Integrated Construction Cycle was established in 2013, while in Belgium the players in the dialogue are involved in training activities through a wide range of joint bodies. In Poland as well the social partners share common initiatives based on intersectorality – national or European projects, such as Leonardo da Vinci and Erasmus+ – concerning vocational training for construction. In this regard, it should be stressed that today, in particular, it is the field of **vocational and continuing training** for construction workers which represents an opportunity for all the BROAD partner countries and, therefore, also an instrument for multistakeholder social dialogue on sustainable construction.

For further insights and the specifics of social dialogue on sustainable construction at national level (drivers and difficulties, tools, good practices and areas of intervention) please refer to the **national reports and guidelines** provided in this volume.

3. STRENGTHENING EUROPEAN SOCIAL DIALOGUE ON SUSTAINABLE CONSTRUCTION

3.1. Conditions

In the light of the above and what emerged in the course of the comparisons and exchange of knowledge and experience among the BROAD partners, it is possible to identify, above all, some **essential conditions** for the implementation of European social dialogue on sustainable construction. These conditions concern:

- i)* a clear **assumption of responsibility** based on the will and the position of the various parties involved in the social dialogue;
- ii)* the **adequate, informed and continuous involvement of the social partners** at all stages of the processes of governance (definition, implementation, monitoring, evaluation and implementation of strategies);
- iii)* the sharing a **unequivocal conceptual framework** regarding sustainable construction (content, extension, intersectorality, etc);
- iv)* the establishment of a **tripartite institution** for social dialogue activities in the field of sustainable construction that guides and coordinates actions on European policies from consultation and dialogue between the various stakeholders (bottom-up approach) and not only on the basis of the issuing of European Directives (top-down);
- v)* the provision of the **resources necessary** for the implementation of social dialogue on sustainable construction (human, financial, technical, knowledge-related...).

3.2. Key points

In addition to the conditions outlined above, a number of key points are indispensable to strengthen European social dialogue around sustainable building which, more specifically, concern:

- the consolidation of the **relationship between activities of information, consultation and negotiation** with the **decision-making** phase, to allow for the concrete implementation of the actions and measures established;
- the practice of a form of **extended (multistakeholder) social dialogue** that includes, in addition to the representatives of workers, employers and the institutions, experts

(academia, universities and research institutes), and environmental and citizens' organisations to make the most of relations between the European and national levels. In this framework, not only green building should be taken into account, but also the sectors and professions that can be traced back to the green economy in a horizontal perspective;

- the adoption of a **holistic and integrated approach** which, on the one hand, considers the **whole value chain** of the construction sector, the industrialisation process of the production cycle, the circular economy paradigm and the perspective of the life cycle of the product and process with ever-greater interaction between construction-regeneration-maintenance-services and, on the other hand, the **social dimension** associated with sustainable construction, often mentioned but, in fact, less practised;

- the assumption of a **cross-sectoral perspective** on sustainable construction (both at the level of impact on the entire economic system and the fragmentation of the various policies involved, ranging from interventions related to energy efficiency, social housing, urban regeneration, etc);

- the necessary consideration of the **effects connected to the introduction of technological innovations** in the production processes, design and construction of buildings, in the organisation of production and labour throughout the whole chain;

- the placing of **knowledge about sustainable construction** based on information sharing, consultation and negotiation by the parties involved, as a **precondition** for outlining directions and guidelines, on the one hand, and, on the other, making shared decisions (for provisional, management and evaluation purposes *ex post* of the measures and interventions initiated and tested; for re-orienting actions and policies from a perspective of maximising benefits compared to resources; for spreading positive practices – integrated approach, intersectoral perspective and life-cycle of the product and process, the introduction of elements of innovation and technical and social technologies; for disseminating information that affects citizens' behaviour, orientation and decisions on energy transition in the construction sector);

- the **enhancement of existing European instruments and resources** – such as, for example, the European Construction Sector Observatory (ECSO) established in 2016 or platforms such as the Covenant of Mayors for Climate and Energy for the Implementation of Sustainable Energy and Climate Action Plans (SECAPs) – or currently being trialled, such as the Handbook for the Introduction of Building Information

Modelling in the European Public Sector (2017), drafted recently by the EU BIM Task Group;

- the establishment of **committees, observatories, forums and working groups on specific themes** regarding sustainable construction, which may include, among others: energy and climate change; urbanisation, social housing and the security of the territory; research, innovation and relationships between business and academia; training and changes in the labour market; demographic trends and emerging new needs.

4. THE AGENDA OF EUROPEAN SOCIAL DIALOGUE ON SUSTAINABLE CONSTRUCTION

The **agenda** of European social dialogue on sustainable construction could be geared towards a number of relevant actions organised in **four areas** – as outlined in the following paragraphs – concerning policies and the regulatory framework, working conditions and new skills, technology, knowledge and innovation, and the cultural dimension.

4.1. Policies and the regulatory framework

Regarding policies and the regulatory framework, the action of the European social dialogue on sustainable construction could intervene in relation to:

- the formulation of a permanent, **institutionalised tripartite social dialogue model** that will enable the definition, co-ordination and monitoring of the initiatives to support sustainable construction (to promote – where absent – the establishment of permanent structures for social dialogue on sustainable construction at national and local level);

- the issuance of **European Directives providing for national interventions** on regulatory frameworks and incentive systems in support of sustainable construction;

- the inclusion in the European Works Councils (EWCs) and in International Framework Agreements (IFAs) of clauses on sustainable development and green building;

- the strengthening of **public investments** (governments and public bodies should be role models of large contractors);

- the definition of a **long-term strategy for the continuity of the financing of green building** and the renovation of old buildings, also in the context of social housing;

- the regulation of the **construction market** in order to establish competition between companies in the sector on the **quality of products, the type of use of construction materials and production processes** and not on the reduction of costs (e.g. by introducing more stringent environmental criteria in the definition of procurement procedures);
- the formulation of European strategies in support of sustainable construction capable of taking into account **economic and social specificities at national and local level**;
- the standardisation of building **certification** criteria to create a **common European framework** that is also capable of considering the environmental, hydro-geological and climatic features of the different countries;
- the **coherence of public policies** in the Member States on sustainable construction with respect to **urban planning, housing and land management policies**, also taking into account the needs of people and increasing their well-being in their living and working environment;
- the activation of **public-private partnership** mechanisms, facilitating the rules governing procurement and increasing attractiveness for investors;
- the provision of funding for **public research**;
- the development of **research and development** activities regarding products and processes, in order to improve competitiveness and commit to the adoption of sustainable construction models by extending the integrations relating to the chain of new materials and the "sensorialisation" of the built environment (interweaving with the evolution of domotics).

4.2. Working conditions and new skills

With respect to **working conditions** in sustainable construction, European social dialogue could address:

- the promotion of employment and organisational policies aimed at **respecting decent work** and **increasing the quality of work** (opposing illegal employment practices, prevention from the point of view of health and safety, job creation and environmentally friendly occupations, etc);
- the **impact on working conditions** due to transformations, the reorganisation of production chains, production processes and the introduction of new technologies;

- issues related to **migrant workers** and their full inclusion;
- the **lack of qualified workers** and, in the other direction, support for workers for the purposes of their **qualification, retraining and specialisation**;
- the definition and harmonisation of **professional profiles at a European level**.
- the definition of a **closer link between public incentives** (direct, indirect, fiscal) **and respect for national collective labour contracts** and regular NI contributions.

Actions regarding European social dialogue on skills and training could take into account:

- the integration of **sustainability Issues** and contents related to changes in the field of sustainable building (taking into account new technologies and digitalisation processes) in the curricula of vocational, continuing and tertiary (university and non-university) education relevant to the sector;
- the promotion of vocational and continuous training for both **high- and low-skilled professions** in sustainable construction, paying special attention to the inclusion of **young people and women**.

4.3. Technology, knowledge and innovation

With regard to access to and the circulation of **knowledge**, the introduction of **innovations** and new **technical and social technologies** in the sector, the agenda of the European social dialogue on sustainable construction could involve:

- the exchange of knowledge on the challenges and needs arising from the adaptation of the construction sector to the sustainable economy, in order to achieve a **shared understanding** among the stakeholders of the various MS;
- the training of **decision-makers and stakeholders** in the sector;
- the dissemination of information on green building measures and the means of integration and cooperation between the **various professional categories** operating on sites to ensure the quality and effectiveness of the sector;
- the dissemination of **good social dialogue practices**, taking into account the **formal and informal national networks** already existing in some countries, as well as the practices relating to the best interventions on zero-impact building, the introduction

of innovations based on the adoption of an integrated approach in the production cycle and so on;

- support for the creation or consolidation of **relations between academia, businesses and trade unions**, together with the establishment of **international academic networks**.

4.4. The cultural dimension

The **cultural dimension** is a further area of action for European social dialogue insofar as it constitutes the broader context in which the transition towards sustainability in construction is taking place. Actions in this area could relate to:

- the determination of interventions intended to **foster the cultural change** needed to transform sustainable constructions into a real need in European society;
- the **dissemination of information** on sustainable building between citizens and businesses (opportunities and benefits, incentives, constraints and procedures, etc), including through the opening of **public offices and/or helpdesks**; also run by the same players involved in the social dialogue;
- the call to assuming **responsibility regarding costs** (often unrecorded) relating to health and environmental problems that arise from the **unsustainable behaviour** of the players directly responsible for the construction industry and which have an impact on the health conditions of all citizens (the healthiness of environments, noise, risk in natural disasters, etc).