GBCe Country Report 2021
On the Status of Sustainable Building in Spain
Credits

Report coordinated by GBCe and jointly prepared by the GBCe and KREAB.

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Executive Summary

The GBCe Country Report aims to respond to the question “How can we stimulate civic demand to accelerate transformation in our sector and shift its environmental model towards a more sustainable one?”

Answering this question is anything but simple. On one hand, we need the instruments to stimulate demand, and on the other hand, the capacity to measure progress and, the most important thing, to organise and prioritise fields of work so we can be efficient and optimise resources.

This Country Report sends out three clear messages:

1. The five levers that need to be activated to create more demand are: funding, regulations, communication, innovation, and training.
2. The lack of data on the actual performance of buildings and the poor digitalisation of construction processes and building management make it difficult for us to define the measures necessary to make a change.
3. The sector has to focus its efforts over the next decades on 6 areas for urgent action: decarbonisation, health, complete renovation, a resilient society, biodiversity and the circular economy.

Although the Country Report describes the levers, the topic of measurement, data and urgent actions in more detail, below is a summary of the most important messages included in these three key sections:

A. The Levers

1. Regulation and political strategy

In Europe:

- Since 2002, Europe has been steering towards a uniform regulatory framework for all the member countries, by adopting the EPBD, the Energy Performance Buildings Directive. A review of the EPBD in 2021 anticipated a 9% reduction in energy consumption between 2020 and 2030.
- In 2018, Europe launched the European Green Deal in a bid to be the first carbon neutral continent by 2050. Along with the European Climate Law and the Fit for 55 Package, Europe aims to reduce its net emissions by 55% compared to 1992.

In Spain:

- Spain has followed in the footsteps of Europe with the Long-Term Renovation Strategies (LTRSs), the Climate Change and Energy Transition Law, the National Energy and Climate Plans (NECPs) and the Spanish National Climate Change Adaptation Plan (CCAP), with the building industry as a key sector for the country’s transition.
- Spain aims to renovate 27.4% of its housing stock before 2050.

2. Funding

In Europe:

- In 2019, Europe activated a very important lever in changing the European economic model: the Sustainable Finance Taxonomy.
- The Taxonomy seeks to create a classification of activities that make a substantial contribution to the EU’s Sustainable Development Goals under specific criteria to standardise what is considered sustainable.
- According to the IFC, sustainable buildings represent an investment opportunity of 880.7 billion dollars in 2030, 60% of which will go towards the residential sector.
In Spain:

- With Next Generation Funds, the renovation of **250,000 homes per year** would have a leverage effect on the labour market of **135,000 direct jobs**.
- A public and private investment of 83.54 billion euros is planned for energy saving and efficiency measures and 91.765 million euros for renewables as part of the NECPs.

### 3. Innovation

**Obtaining data:**

- The application of new technologies in the sector is marked by a major need for **data acquisition, management and analysis** and their integration into all phases of building construction, from design and planning to monitoring throughout the lifetime of the buildings.
- The **Internet of Things** (IoT) for buildings and cities has emerged as a growing market. Smart buildings and cities are a major advance in the management of data in real time.

**Methodologies and Protocols:**

- One of the most important innovations in the building sector and across all construction and renovation in general, is the use of collaborative design models with special relevance to **BIM methodology**.
- BIM serves as a basis for **LEAN construction** and for constructing a digital twin of our buildings.
- The traceability and veracity of data are crucial in the sector, which is why **blockchain** is an important technological innovation to bear in mind.

**Products and Business Models:**

- Despite its advantages, **industrialisation** of the entire building sector in Spain accounts for only **1% of total construction**, a figure far removed from other European countries, such as Holland (50%) and Sweden (over 90%).
- Business innovation is one of the **new models of chain collaboration**: Lean construction, IPD contracts and energy performance contracting or EPC.
- Circular economy principles have made a leap into building systems with rental or servitisation of façades.

### 4. Communication

**On social networks:**

- The debate around the **building and sustainability binomial** is still only relevant for a **small percentage of the population**, as only 4% of the messages published online belong to this sector.
- The main topic of conversation on social networks revolves around **renovation**.
- In general, there is no link between renovation and the pursuit of sustainability, but rather a focus on the pursuit of **energy efficiency**.
- 58% of the conversation around sustainability and construction has occurred since May 2020, because of the NextGenerationEU Fund and the Climate Change and Energy Transition Law being passed.

**Trade press:**

- In the trade press, 88% of the references compiled openly address the renovation of homes, buildings and cities, although only 0.7% of them are linked to sustainability.
Politicians:

- Although politicians are quite active on social media and discuss a range of subjects, **housing and housing stock is not their main concern.** It accounts for only 0.44% of the conversations held by politicians on social networks - a very low figure if we consider the current housing access predicament.

5. Training

- Professionals with a university level education have not had access to sustainability classes during their ordinary undergraduate degree. In fact, 80% of the profiles had to attend **complementary training** to equip themselves for sustainability during their career.

- There will be three major focuses in the future development of the sector: **digitalisation, sustainability and industrialisation.** Training for workers should be in line with these three areas, preferably in a joint and related manner.

- **Innovative training initiatives** include developing the range of courses on offer online via MOOCs, new methodologies such as “learning by doing”, or dual training, whereby the students alternate their training between the training centre and the company.

4. The two weakest levers are training and innovation. In terms of training, there is still a long way to go and it is a key lever in educating the industry. Innovation is making a comeback, but there is still plenty of room for growth.

B. Measuring

In order to be able to make decisions and make a case for them, we need objective data, or as objective as possible.

Knowing whether a building is more sustainable than a standard building calls for a framework that defines how we measure that improvement.

That is why it is important to measure the sustainability of buildings, both in the construction phase and in the use phase.

Advantages of measuring sustainability:

- **Exploring and understanding** how the building works
- **Defining sustainability goals**
- Understanding the building’s full life cycle.
- **Facilitating quality control.**
• **Reporting results** in an orderly and useful way for communication.

• **Checking** the differences or similarities between the project forecasts and the actual running of the building.

After 12 years of providing the sector with measurement tools and making a critical reading of the facts, we can conclude that:

• Spain has **very few databases** that allow us to do an in-depth analysis of the status of our housing stock and its development.

• The challenge for the coming years lies in **measuring the performance aspects** of buildings in the use phase and checking them against the theoretical measurements in the design phase.

• Regardless of the certification system used, the Spanish market clearly shows that its aspiration is limited to obtaining **average results**. There are very few buildings with a commitment to sustainability that reaches a level of excellence.

• Given that there are not more buildings certified with the highest score, we can conclude that sustainability is still an exercise in energy efficiency. The other criteria helping to obtain a higher score are less important when it comes to their implementation.

• Both the **VERDE** and **DGNB** seals have the **LEVEL(s)** and **Taxonomy** European frameworks incorporated into their set of criteria and indicators.

• Certification schemes are a **tool to help** define sustainability goals, establish their planning and optimisation, while implementing quality processes throughout the design development, the construction process and use of the building.

C. Urgent Actions

To build this new model, using the levers and measuring the results, we need to concentrate on six fields of action in the short term:

1. Decarbonisation
2. Health
3. Comprehensive renovation
4. A resilient society
5. Biodiversity
6. The circular economy

The challenge lies in regulating, funding, communicating, training and innovating not just in one or two fields of action, rather in all six at the same time in addition to projects and actions that combine various fields.
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Introduction

Let’s inform the nation: “Despite the urgency, there is no demand for real change”

Green Building Council España has the duty of analysing, diagnosing and communicating information about the current status of the building sector and its progress in shifting towards a sustainable model, without any taboos, in an objective way that provides proposals for the future. That is what this GBCe Country Report is all about.

Spain operates within an international context, essentially Europe. GBCe has the capacity to become a transmitter on different territorial levels to share visions, initiatives, and common actions to take. This Country Report outlines the major chapters of action so that each in his or her field of action can accelerate the processes, having learned from others.

Over recent decades, we have been living in an ongoing emergency situation: pandemics, climate change, economic revival, social divides, cultural intolerance, media manipulation and political poverty. Are we settling for a state of permanent alert?

“A petition or request for something, particularly if it involves a demand or is considered a right”. It is as if we consider an office without clean air or a poorly insulated home as normal, while we have the right to demand something of much higher quality. There is no demand for a healthy city.

We need conscious change, not accidental; a change of model, not brand; an accelerated change, not incremental; a change in the definition of the standard, not a slight percentage improvement in the 20th century benchmark.
Green Building Council España presents the GBCe Country Report v.0 as a diagnostic and proposal document to alleviate the lack of demand for a sustainable model in the building industry.

To create demand, we have to find the right levers and activate them. In line with the WorldGBC’s Theory of Change, GBCe describes a framework for action hinged on five levers to bring about change in the demands on our buildings and cities.

More demand can be created by activating the five levers: communication, training, regulations, funding and innovation.

They are not watertight levers: communication reinforces the other four; funding is necessary for innovation and it has to come with regulations; training is the basis for the others to have an impact on a larger scale; innovation requires regulatory security and communication to be understood; regulations without an educated audience or a sector that is unable to fund itself is meaningless.

Along with the measures inherent to each lever, it is fundamental to measure the evolution in changes, both in the building model as well as demand, a decisive element when it comes to defining the product. Measuring the evolution allows us to do regular in-depth analyses of the status of sustainability in the industry and propose adjustments or new strategies.

To be able to activate levers and define the long- and short-term objectives, we need to know the speed of change on an ongoing basis. Decarbonisation, water management, the level of involvement of the circular economy, the health and comfort of our indoor spaces, the cost added to the change model or the adaptation to climate change are challenges we can measure.

Once the data has been obtained, verifying and validating the results will be key for the sector. We then define the measurement framework: what, how and why.

This GBCe Country Report is called version 0 because it describes the framework, structure and support on which the actions are hung in order to further stimulate and activate demand. It is not a report with much quantitative information, but rather it puts in order and structures the work to be done over the coming years with a single objective: to increasingly ascertain which actions will help to create more demand, which is necessary to trigger a more accelerated transformation.

This report describes the structure of a digital environment that will be presented in 2022 as a “measurement library”, as a “data forum” and as a “catalyst for change”.

Versions 1, 2, 10 etc. of the GBCe Country Report will provide a regular interpretation of this digital database shared across the sector.
Is it urgent?

The question of whether there is urgency is akin to the question we asked ourselves at the World Sustainable Building 14 congress in Barcelona: “Are we moving as quickly as we should?” They are rhetorical questions. Having to resort to irony to elicit a reaction is sad.

In 1972, The Limits to Growth report commissioned by the Club of Rome clearly discussed the fact that limits exist, that nothing is infinite. In 2009, Johan Rockström and the Stockholm Environment Institute defined the framework of the boundaries of our planet. The results can be seen in the documentary “Breaking Boundaries.”

4 out of the 9 planetary boundaries are operating in the high-risk zone: climate change, land system change, biodiversity and soil nitrification. Our sector has a substantial influence on the first three boundaries. Climate change and biodiversity have a direct impact on human survival. When it comes to these four areas, we have crossed the boundaries and there is a great urgency to act.

Climate change mitigation and adaptation measures have scientific backing based on objective data. Decarbonisation is no longer a mere need, and must become a common denominator in any political, industrial, educational or financial decision.

In the recent past, we have shown that we can retreat from a danger zone to a safe zone by acting in a coordinated way between science, policy and industry. The hole in the ozone is within acceptable boundaries.

The COVID-19 pandemic has not hesitated in clearly outlining our society’s boundaries around cohabitation, shared responsibility and (in)tolerance. Apart from having put our social skills to the test, it has succinctly shown that our model of city and daily living is obsolete.

The 21st century started in 2020 with a global reflection on the dangers of not having limits to movement, to international trade, by taking our freedom for granted. There is an urgency around going back to assessing things in a more local context, to understanding the wealth of each place, to recognising that diversity is value than enriches cultural development as a society.

That diversity must be reflected in cities, in housing typologies, in the products we can acquire, in education systems, in languages, in mobility schemes, in tastes and colours...

Now more than ever there is a pressing need to understand local values in an entirely limitless reality..
Is there demand?

A direct and simple indicator for measuring whether there is a demand for sustainability in building is the number of voluntary environmental certificates issued. Spain started the 21st century with practically zero demand for buildings certified with a national or international sustainability seal like VERDE.

The property bubble of 2001-2005 stood out for the disproportionate offer of unsustainable buildings with poor energy performance, outdated architectural solutions and a lack of attention paid to social and environmental issues. The market was however able to absorb up to 600,000 new houses a year in this period. The bubble burst and since 2011, a tenth of this number of houses has been built.

Certification has evolved in the opposite direction: from being practically non-existent, it is now on an upward curve at around 100 buildings/year with a sustainability seal and there are clear signs of year-on-year growth. But it still represents less than 0.1% of the total buildings constructed or renovated.

At the extreme end of minimal social sustainability, trends are also changing around social housing policies. The policies sustained over 40 years of private development balanced out in 2006 with different figures for the affordable housing supply.

It is very likely that the current economic conditions will have a trigger effect on demand, due to both public support for renovation and building sustainability in general, as well as the intrinsic economic conditions (fundamentally ESG criteria and the Taxonomy), which tend to keep less sustainable real estate out of the market.

The background is undeniably cultural, a kind of “eternally pending subject” because demand depends on an appraisal –desirable and a priority– of the sustainable property (or urban environment), a perception that does not exist at present because to do so one has to “see”.
What change?

Changes are never abrupt but the urgency is compelling us to keep on insisting on the fact that we need other models for building, living in and creating cities.

In 1987, the Brundtland Commission defined sustainable development as “meeting the needs of the present without compromising the ability of future generations to meet their own needs”. And if we look at the impacts of climate change alone, then it’s clear that we are not taking part in any kind of sustainable development. Science has shown us that we are harming the development of future generations.

In 2019, after leading the creation process for the SDGs, Paula Caballero suggested the idea of adding one further goal: a change in attitude. Perhaps it is the most important objective we need to really be able to turn the tide.

Throughout history, society has designed its buildings, cities and territories to be organised on a local or global level, to accommodate more or less social units, and to develop in a more or less material way. The current world we live in is characterised by pandemics and resource depletion, and the sector is seeking to adapt buildings to an environment perceived as scarce and threatening.

Buildings are changing at triple the pace of their property value, the evolution of their inhabitants and their performance in a living environment. Policies and strategies to support the changes to buildings follow the dynamism between these three main areas.

What is important is to understand that many areas have to change and this change happens at many levels. And sometimes it is gradual and organic, while on other occasions it comes about through external, sudden or profound efforts.
Let’s suppose that we agree that buildings should not segregate the population, nor make it sick, nor occupy more fertile land nor require more energy than 15 kWh/year per m² to run nor emit more CO₂ than they can cancel out. The goal for 2050 would be to mitigate climate change, to adapt ourselves to worse conditions than the current ones, and to build resilience to thrive towards frugal, equitable and durable habitability.

**How?**

Comprehensive interventions in highly replicable typologies with low-impact materials and transport that are modular, easy to disassemble and reuse, with a lot of social pedagogy, leveraging public investment, which regenerates the city and rural world with major ecological corridors that become the backbone of the territory once again, with sector professionals who, in addition to having specific skills, have a solid command of environmental, sociocultural, eco-financial and organisational mainstreaming.

**Who is positioned as a leader and who are the “masses”?**

Leadership and government should be multi-level, in networks, dynamic, mediated by very plural, transparent and traceable communication and decision-making mechanisms, with accountability, co-responsibility and in-depth and far-reaching plans and roadmaps that include review and course adjustment mechanisms.

At GBCe over the coming years we are going to assess the levers that make up this report: the financial world, the regulatory world, communications, training and innovation. The change will come about by moving different levers at the same time.
Thinking about the future of our space

A built space is testimony to the social organisation, culture and economy of each period of time. Historically speaking, it has been one of the main productions of societies and civilisations, and in it the concerns and convictions of each era have crystallised in the shape of a habitat, bequeathed to the next generation with the capacity to actively communicate them. That is why any profound change in a society, direct or indirect, entails a review of its own location, the city, and the way it is built.

At this present time, in which we can see that humanity has spent decades taking stock of the negative impact of its activity on the natural world as we know it, and thus on itself, this status as a vehicle for change that we recognise in the built environment and in the way we create it, acquires a very relevant meaning in light of the figures echoing loudly in political and social spheres: building represents 40% of final energy consumption, and it is the cause of 36% of CO2 emissions and 35% of the volume of waste in the EU.

From a building perspective, today’s concerns come with reflections that go beyond geometry and stylistic and functional matters, and focus on the building’s performance and its impact on the natural world and people’s health. These concerns are leading us to address matters such as the relationship between the city and the national territory, energy efficiency during the use phase, the amount of carbon embedded in the complete life cycle of the building, the building’s capacity to respond comfortably to the current and foreseeable climatic snapshot, the capacity of the constructed space to supply future societies with different cultural features, the capacity to provide well-being without a negative impact on our health, the blueprint for the life of the materials so that they remain in the economic cycle... all of which have the ability to determine how.

Justo Orgaz
President of GBCe
Apart from the major commitment stemming from the Paris Agreement (2015), the most important global challenges of our time affecting buildings include the commitments arising from the New Urban Agenda (Quito, 2016) and the Davos Declaration (2018), partly inheriting the spirit of the Leipzig Charter (2007), which recognises the need to preserve and bring up to date our built heritage because of its high material and cultural value, and to extend the amortisation of its environmental impacts to sustainable limits.

These commitments entail becoming aware of that fact this is the start of a period in which we will intervene intensively on existing buildings, modifying their systems and incorporating new ones, in order to adapt them functionally to new needs and provide them with new features, often with a major impact on their materiality and presence, and therefore on their identity. An identity which, as a last resort, contributes to forming the identity of society itself and people, too.

This is why what we call building sustainability, which aims to provide an answer to these matters, has been instated in the major order of architecture as the main axis of the discipline’s reflections, which has to provide society with solutions that orchestrate classic concerns along with those inherent to our times, in order to be able to leave to future generations not only material and cultural value, but also, —and urgently— environmental value.
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The regulatory world of the building sector

The role of regulations

Building is fundamental in our economic and social model; it is both a market good and a physical support for our lives. Therefore, its regulations cover the industry’s whole value chain and have an impact on the most basic aspects of building. Despite everything, over recent years, the relationship between regulations and building has gained relevance due to the opportunities it provides for sustainable transformation of the socioeconomic system. Thus, building has come to be a vector for the ecological transition and a lever to revitalise the economy following the pandemic crisis, but also to help hit the social targets set by bodies such as the United Nations through the Sustainable Development Goals.

The Spanish Constitution specifies that “the public authorities shall promote the necessary conditions and shall establish standards in order to make this right effective”.

What is more, decent and adequate housing is a basic universal right according to Article 25 of the Universal Declaration of Human Rights of 1948 and according to Article 47 of the Spanish Constitution. Thus, public authorities continue drafting laws and action plans that make these rights effective. Despite regulation on the topic having changed very little, the concept of decent housing has indeed evolved in accordance with the socioeconomic paradigm, including economic aspects such as affordability and financial comfort, social aspects such as equal opportunities and inclusion, and environmental aspects, such as the impact on biodiversity and climate.

“All Spaniards are entitled to enjoy decent and adequate housing”

Article 47 of the Spanish Constitution

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It is precisely these aspects, particularly decarbonisation and energy efficiency, that have pushed public authorities, and especially the European Union, to raise their level of ambition, drafting strategies and enacting new laws focusing on the sector’s sustainable transition over recent years.

Despite that, the concept of sustainability covers more aspects than just the fight against climate change. Building regulations also include environmental aspects of biodiversity, the circular economy or water efficiency; economic aspects such as the life cycle value of buildings; and social aspects, such as urban and rural cohesion, access to basic services, health and habitability.

The latter concept has gained greater relevance due to the pandemic and social isolation, as the differences in terms of habitability among the different population groups have become clearer. To meet these social needs, regulators have coined the term “fair transition”, which seeks to tackle the challenges of the climate crisis by integrating social, environmental and good governance criteria into decision-making.

At a national level, the increasingly difficult access to decent housing has led to a social debate organised by the first Spanish Housing Act.

The policies do not solely apply to the housing sector, but also to other real property such as offices or other buildings. Due to the different nature of these buildings, their ESG (environmental, social and governance) requirements also vary. To illustrate the scenario, concepts such as health and operational safety and the well-being of building users acquire greater relevance in commercial property.

With regard to the private sector, regulatory developments are having various impacts on companies. On one hand, the companies that make up the supply side will have to transform their business models to adapt to the new minimum energy efficiency and habitability requirements established by the public administration bodies. On the other, public investment is expected to have a devastating effect on the sustainable finance sector, since the share of private investment in total investment is still a minority.
Political and regulatory developments in the building sector

At an international level, different milestones have marked the innovation sector’s political agenda. It is such that Article 25 of the Universal Declaration of Human Rights of 1948 includes the universal right to adequate housing. In 1997, the Kyoto Protocol had already highlighted the importance of climate change and energy efficiency, placing buildings in the spotlight because of their relevance to the environment. In 2015, the Paris Agreement was another decisive step, committing the signatories to keep global warming below 2°C compared to pre-industrial levels, with the ambition of not exceeding 1.5°C by the end of the century. That same year, the Sustainable Development Goals, especially goal 11 called “sustainable cities and communities”, showed a change in the sustainability paradigm, now understood from the point of view of the impact generated in a holistic way in economic, social and environmental terms.

At Community-level, the European Union (EU) is very active when it comes to approving documents to combat climate change. The EU’s objective is for Europe to become the first climate-neutral continent in 2050, which is why it has rolled out regulatory initiatives and launched financial instruments that promote decarbonisation and the transition of the productive system. At a national level, competences are focussed on the right to housing and the quality of buildings. In the area of sustainability, the recent Climate Change and Energy Transition Law will set the sector’s agenda for the coming years, making the fight against climate change a legal obligation, with a focus on the sector as a energy efficiency and decarbonisation vector. However, before the law was passed, Spain already had energy efficiency regulations.
The different updates to the Spanish Technical Building Code (TBC) have put an emphasis on the update to the Basic Energy Saving Document and extended the requirements on safety (structural, fire and use) and habitability (noise protection and health), and more aspects of sustainability are expected to be added which, until now, have not been included.

In addition, the RITE (Regulation for Thermal Installations in Buildings) and the EPC (Energy Performance Certificate) have been adopted and successively modified.

At urban level, town planning legislation has been updated with the adoption of new laws such as the Spanish Land Law—adopted for the first time in 1956, the first version of which dates from 2007—and the Law on Urban Rehabilitation, Regeneration and Renewal (LRRR), which were consolidated into a single text in 2015.46

The autonomous communities and municipalities also regulate buildings as part of their territorial competencies and scopes.


Although great disparity exists between the autonomous communities, they all have their own Land Laws (competency over the territory) and they have competencies in terms of housing, territorial planning and habitability policies.

For their part, the municipalities play a key role in building management, as their job involves establishing urban rehabilitation, regeneration, renovation and development policies, they set higher requirements for habitability and execute social policies related to buildings such as civic participation and combating energy poverty.
Towards a climate-neutral and sustainable Europe

The European Union is giving a huge boost to the environmental, social and economic policies that affect building: the EU’s long-term strategy and the regulatory developments related to it (the European Climate Law, the European Green Deal, the Sustainable Finance Action Plan and Fit for 55) and the Recovery Plan for Europe\(^47\) for which the NextGenerationEU funds are key.

Despite that, the EU has been active in the field of sustainable building regulation since the Energy Performance of Buildings Directive (EPBD) was adopted in 2002. The directive has been updated on several occasions and another amendment is expected.

Other noteworthy European regulations are the regulations on the requirements for ecodesign and the labelling of energy-consuming products, which affect the range of energy systems in buildings; the Renewable Energy Directive\(^48\), which was last reviewed in 2018; the Energy Efficiency Directive (2021), aimed at reducing energy consumption in 2030 by 9% compared to 2020; and Regulation (EU) 2018/1999 on Governance of Energy Union and Climate Action\(^49\).

For more information on other regulatory developments, we recommend consulting the GBCE Agenda of the European Union for Sustainable Building.


The European Union's long-term strategy

In November 2018, the European Commission launched its long-term strategy to become carbon neutral by 2050 as part of the Paris Agreement. The EU’s long-term vision is to modernise, improve competitiveness and create a prosperous economy that integrates social actions into decision-making.

With the launch of this strategy, the EU seeks to position the continent at the forefront of the just climate transition, through investments in realistic tech solutions, harmonisation of policies across countries, innovation in financial instruments and citizen education.

In July of the same year, the European Climate Law was adopted, leading the EU stepped up its climate ambition and set new objectives in order to accelerate the transition. Thus, a new net emissions reduction target of 55% below 1990 levels was set. The Law was accompanied by the Fit for 55 package, which proposes legislative changes in a range of areas to help meet the new target.

Building is one of the EU’s priority industries, since along with other sectors like transport and manufacturing, it is a vector for decarbonising the economy thanks to its capacity to integrate renewable energy into the energy mix through electrification and self-consumption. In addition, reducing energy demand by renovating buildings is an especially relevant measure when it comes to hitting energy efficiency climate objectives.

European Green Deal

- European Climate Law
- Climate Change Adaptation Strategy
- Biodiversity Strategy
- Circular Economy Action Plan

"Fit for 55" Legislative Package

- Effort-Sharing Regulation (ESR)
- Renewable Energy (RED)
- Energy Efficiency Directive (EED)
- Carbon Border Adjustment Mechanism
- Review of Emissions Trading System (ETS)

Drafted by the authors, Green Building Council España (2021) based on information from the European Parliament:
The Green European Deal

The EU’s ambition to make Europe a climate neutral continent by 2050 has resulted in the European Green Deal. This programme was launched in December 2019 and indicates the roadmap for the policies and investments for future decades. The European Green Deal includes the developing sustainable transition strategies and the mobilising financial resources from public and private sources to environmentally, socially and economically sound activities on the content. The plan’s initial design anticipated the mobilisation of 100 billion euros, but due to the health crisis, the final funding amounts to more than 1.8 trillion euros in the 2021-2027 period.

The Renovation Wave

According to the EU, around 75% of European buildings are not energy efficient and, despite that, 85 to 95% of them will still be in use in 2050 in this continent. Buildings are responsible for approximately 40% of the European Union’s energy consumption and 36% of greenhouse gas emissions. Thus, as part of the European Green Deal, funds will be mobilised to raise the rate of renovation of public and private buildings, which currently stands at 0.1% in Spain. Given the building industry’s capacity to generate local and sustainable employment, the recovery, transformation and resilience plans have also incorporated renovation as one of their main components.

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54 European Commission. [https://ec.europa.eu/energy/topics/energy-efficiency/energy-efficient-buildings/renovation-wave_en](https://ec.europa.eu/energy/topics/energy-efficiency/energy-efficient-buildings/renovation-wave_en)
To increase the rate of renovation, the European Commission has designed the Renovation Wave. This strategy aims to improve the energy and resource efficiency of buildings and promote new, innovative funding and investment alternatives.

However, the Renovation Wave goes a step further; it also wants renovation to improve the quality of life of those who live and work in buildings. In this area, the concept of social justice has been included in the Renovation Wave from a perspective of inclusion and quality with the aim of leaving no one behind, especially through public intervention for the rehabilitation of social housing.

At the very least, the strategy aims to:

- Duplicate the rate of renovation of the housing stock in the next 10 years.
- Renovate 35 million homes between 2021 and 2030.
- Create 160,000 further jobs in the construction industry.

Other European Green Deal Initiatives

In addition to the Renovation Wave, as part of the European Green Deal other strategies with an impact on the building sector have been developed.

The Level(s) Framework\textsuperscript{57} will be used to assess the sustainability of residential buildings and offices and will have an impact on the Spanish Technical Building Code (TBC).

On the other hand, the New European Bauhaus is an interdisciplinary initiative the seeks to connect the concepts of design, sustainability and investment with the aim of bringing the European Green Deal to life and focussing the debate of the aesthetics of the ecological transformation.

The aim is to ensure that the renovation of housing stock not only facilitates the energy transition, but also creates culture and identity.

In addition to these strategies and regulations, other important initiatives have been rolled out:

- The European Commission’s recommendation on energy poverty
- Circular Economy Action Plan
- Global Strategy for a Sustainable Built Environment
- The Strategy for a Sustainable Built Environment
- Review of the EPBD\textsuperscript{58}


\textsuperscript{58} https://ec.europa.eu/energy/topics/energy-efficiency/energy-efficient-buildings/energy-performance-buildings-directive_en
Sustainable finance: the EU taxonomy and building

The first challenge in allocating funding to sustainable activities was defining what is sustainable and what is not. In this regard, over recent years the European Commission has been working on a sustainable finance taxonomy, which aims to identify which activities could be considered sustainable. This resulted in Regulation (EU) 2020/852 on the establishment of a framework to facilitate sustainable investment and all its implementing documents that comprise the so-called “EU taxonomy”.

As part of the Sustainable Finance Package adopted in April 2021, the Commission reviewed the NFRD (Non-Financial Reporting Directive) through the CSRD (Corporate Sustainability Reporting Directive). One of the new developments was a new requirement for organisations obliged to submit a non-financial information statement to report quantitative data concerning the amount of revenue, OPEX (operating expenses) and CAPEX (capital expenditure), which meets the requirements established by the taxonomy. In addition to this, the CSRD will increase and standardise the transparency requirements in terms of non-financial information, which will raise the quality and quantity of the information available in the sector and require companies to include sustainability-related aspects in their information and accounting systems.

Build Back Better: *Europe's sustainable reconstruction*

Before the pandemic hit, the European Union had already started the sustainable transformation of the production system. With the outbreak of the largest health and economic crisis in recent times, the EU's intention has been accentuated by the launch of the temporary NextGenerationEU plan. Using this plan, the EU will inject 750,000 million euros into post-pandemic economic and social recovery, under the principle of build back better: the recovery should give us a chance to transform our economy and society to make us more digital and sustainable. As already mentioned, building is one of the main pillars both for renovation policies and projects related to clean-energy, digitalisation or urbanisation and modernisation of cities.

In addition to the NextGenerationEU initiative, the European Union has a year-on-year budget of more than a billion euros for the 2021-2027 period. The combination of both instruments provides the European Union with a budget of 1.8 billion euros to promote the just transition of the economic community.
Sustainable building regulation in Spain

The European Union’s sustainability momentum has caused a regulatory domino effect on a national scale. In this report we focus on the most recent regulatory developments, since they will shape the context of sustainable buildings over the coming years. Thus, the main regulatory instrument in Spain is the Technical Building Code (TBC)\(^6\), adopted in the year 2006 pursuant to the Building Standards Law.


The regulatory and strategic drive towards sustainability

In 2020 Spain declared a climate and environmental emergency and defined its owned emission reduction targets and transition to a more sustainable model\(^6\). The decarbonisation roadmap includes reducing greenhouse gas emissions by incorporating renewable energy sources and reducing energy consumption, as a commitment to nature-based solutions to restore ecosystems and promote the absorption of CO\(_2\) emissions. Building is a core feature of this future vision\(^6\) as part of the country’s urban environment and economic and social fabric. Thus, building will become a vector of decarbonisation through integrating sources of renewable energy and building renovation, but also through education, sustainable investment and investment in the industry’s value chain.


Find out more about the role of innovation in the sustainable transformation of the sector in the "Innovation" chapter
The adoption of the Spanish Climate Change and Energy Transition Law in 2021 is a legal recognition of the commitment to becoming climate neutral no later than 2050, the date on which the electricity system will have to be 100% renewable. If the law is ambitious over the long term, the target set for emissions reduction for the year 2030 will be lower than that of the EU. The Spanish Climate Change and Energy Transition Law places strategic importance on building, devoting a full article to energy efficiency and building renovation (Article 8), mentioning its collateral importance for certain steps, such as installing electric charging points (Article 15) and advocating for climate change to be taken into consideration in territorial and urban planning and management, as well as interventions in the urban environment (Article 21).

As a part of this framework, almost 30 billion euros of public funds (national and European) are being earmarked, which will translate into direct public aid and support for financing energy efficiency projects to reach the following rehabilitation-related targets, which the LTRSs adopt:

- Improved energy efficiency (thermal envelope) of a total of 1.2 million homes over the decade.
- Improved energy efficiency (heating and DHW heating systems) of a total of 300,000 homes per year on average.

In addition to the Long-Term Decarbonisation Strategy for the year 2050, the National Energy and Climate Plans (NECPs) are the national energy planning tool and they pool the sector strategies to follow to accelerate the decarbonisation process. This plan expresses the following targets for 2030:

- 23% reduction in greenhouse gas emissions (GHG) compared to 1990
- 42% of final energy consumption should be renewables.
- 39.5% improvement in energy efficiency.
- 74% of renewable energy in electricity generation.
“It is time to **put in place** policies that support the **ambitions** set and start to apply them now.”

Inger Andersen, Executive Director of the UNEP

In addition to the NECPs, the Spanish Climate Change Adaptation Strategy (CCAS) has been drawn up. The aim of this strategy is to adapt to the risks arising from climate change and defines the 81 lines of action to be developed in 18 areas of work. One of these areas is specific to “Cities, Urban Planning and Building”, detailing specific proposals for the sector.

Furthermore, the social aspects of housing have gained much relevance as a result of the social isolation caused by the pandemic, with concepts such as habitability, well-being and inclusion being thrust into the spotlight of the debate. In this regard, line 6 and area 3 of the Spanish National Strategy against Energy Poverty describes the role of building (a reduced number of energy poor people). In addition to this, the Spanish Housing Act, which is still being developed, has been launched but is expected in the fourth quarter of 2021. Although other instruments regulating housing previously existed, this Act will be the first national one on the topic. The Act will regulate aspects related to the social impact of housing, such as rental prices and young people’s access to new homes. Plus, it will have an impact on the offer as well as the demand in the building sector.

In addition to these developments, political and regulatory progress has been made in other areas of sustainability:

- Spanish Circular Economy Strategy
- Urban Agenda
- Spanish Law on Waste and Contaminated Soils
- Spanish Royal Decree on Energy Self-Consumption
- Other developments with an indirect impact on the sector such as the Spanish Noise Prevention Act.

A special mention must be given to the Long-Term Renovation Strategy in the Building Sector in Spain (LTRS). This strategy was adopted in 2014 and updated in 2020 to comply with the changes to Directive (EU) 2018/844, a fundamental part of the development of the NECP. The LTRS is an entire document that includes an in-depth analysis of the building sector in Spain and future renovation scenarios in the country to decarbonise the use of buildings by 2030. This strategy brings together 70 measures in eleven lines of action, which are the result of a prior analysis and the participation of the whole building industry.

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64. National Strategy Against Energy Poverty

And add this to the Spanish Recovery, Transformation and Resilience Plan\textsuperscript{66}, which has deployed extensive measures for the building sector, removing the existing administrative and legal barriers through Spanish Royal Decree-Law 19/2012\textsuperscript{67} and earmarking 1.32 billion euros for renewable energies, self-consumption and storage (Spanish Royal Decree 477/2021)\textsuperscript{68} and 11.367 billion euros for building renovation (Spanish Royal Decree 853/2021).

The latter includes a range of renovation assistance programmes to be developed between 2020 and 2023 at a national level, earmarking more than half of the funds to residential settings. With these figures in mind, energy renovation of 175,000 homes before 2023 is anticipated, a figure which could follow the optimum scenario proposed by the LTRSs, but is far from the target of 300,000 homes per years indicated for the year 2030 by the NECPs. Taking into account the LTRS scenarios and the Ministry of Transport, Mobility and Urban Agenda’s projections as part of the Spanish Recovery, Transformation and Resilience Plan\textsuperscript{69}, the 1.2 million households expected to renovate their homes by 2030 would be joined by a further 5.9 million over the next two decades, which would mean:

- 7.1 million homes renovated before 2050, the equivalent to 27.4\% of homes.
- Taking into account an average cost of 17,000 euros per intervention per housing unit, the volume and investment would be 20.4 billion euros invested by 2030 and more than 120 billion euros cumulatively until 2050. In fact, the Spanish Housing Rehabilitation and Urban Regeneration programme is the second most important programme in the Recovery, Transformation and Resilience Plan with investments of 6.82 billion euros between 2021 and 2023.

The strategies also promote renewable energy consumption, which will have a bearing on financing for projects such as the installation of solar panels or district heating networks that favour self-consumption and local production.

In general, these strategies anticipate a reduction of 40\% in the energy consumption of buildings (including all consumption directly linked to fossil fuels. To evaluate investments and simplify the process, energy certification of buildings stands as the main tool, since it enables us to calculate the energy demand before and after the interventions.

\textbf{Figure 3: 2020-2050 energy consumption target for residential buildings}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{energy_consumption.png}
\caption{2020-2050 evolution (by decades) of energy consumption in buildings (GWh)}
\end{figure}

\textsuperscript{66} https://www.lamoncloa.gob.es/temas/fondos-recuperacion/Documents/30042021-Plan_Recovering_30%20Transformacion_30%20Resiliencia.pdf
\textsuperscript{67} https://www.boe.es/eli/es/rd/2021/10/05/49
\textsuperscript{68} https://www.boe.es/eli/es/rd/2021/06/29/477
\textsuperscript{69} https://www.mitma.gob.es/ ministerio/proyectos-singulares/prtr/participacion-mitma/c2
Conclusions

Drawn up each year by the United Nations Environment Programme (UNEP), the "Emissions Gap Report 2021", provides a clear response to the question of whether or not we are on the path to reducing the missions gap by 2030: we are not. The emissions gap is defined as the difference between the total global greenhouse gas (GHG) emissions which would limit global warming to below 2°C, 1.8°C or 1.5°C, and the estimated global GHG emissions resulting from full application of the Nationally Determined Contributions (NDCs) of the Paris Agreement. Therefore, the current NDCs (revised in September 2021) remain far from sufficient if they are to reduce the emissions gap by 2030 and they will lead us to a temperature increase of 2.7°C by the end of the century.

Reaching emissions reduction targets by 2030 is especially relevant if we want to hit our decarbonisation targets by 2050, which would enable us to limit global warming to 1.5°C by the year 2100.

According to the 2020 version of the abovementioned report, the global average reduction required per year to reach emission levels consistent with the 2°C and 1.5°C scenarios, is now approximately four times and more than twice, respectively, what it would have been had serious collective climate action been taken in 2010. Therefore, postponing ambitious climate action, thus delaying the journey to reaching net zero emissions will make reaching the Paris Agreement temperature target of limiting global warming to 1.5°C an impossible mission.

The conclusion is clear: time is running out and what we do in the remainder of this decade until 2030 is crucial. This means climate change-related policies are urgently required. In the words of Inger Andersen (Executive Director of the UNEP), “it is time to put in place policies that support the ambitions set and start to apply them now”.

Given the importance and weight of building, regulation of the sector’s activity has been highly accentuated in Europe, which has positioned it as a world leader in sustainable building.

Therefore, the regulatory framework is and will remain key if we want to reach the sustainability targets in our sector. Europe’s increased climate ambition for 2030 is demanding and is in line with global targets: the fundamental issue is whether the regulatory and non-regulatory proposals translate into specific measures designed in accordance with the anticipated plans and regulations.

Right now, the Renovation Wave is the most relevant instrument for building, since it translates the global climate targets into the building sector, stating that GHG emissions from buildings must be reduced by 60% by 2030. The 23 measures to be implemented by 2024 aim to make this reduction feasible and must therefore be ambitious enough to achieve the targets set. But not only that, they must ensure that the transpositions to the respective EU countries are carried out in a timely manner so that they have the desired effects at the anticipated time.
A very positive point in the Renovation Wave and other European building-related plans is that they introduce measures that go beyond the energy performance of buildings in the use phase, such as the full life cycle of the building, circularity, digitalisation and climate change resilience, all of which are also relevant to accomplishing the 2030 climate ambition. A key question, yet again, is how would these new perspectives be introduced and how would they interact with the existing ones?

Nationally, the regulatory pace concerning combating climate change has followed the climate action set at the European level. With all the recent updates and the (numerous) ones anticipated, Spain is facing the new European frameworks with plenty of ground to make up and particularly significant challenges in certain areas. A clear example of these areas is the introduction of the perspective of the whole building life-cycle assessment.

Furthermore, in order to make effective policies in the areas indicated, there must be coherent development of the four desired frameworks for real implementation: legislative, strategic, regulatory and support material.

If Spain wants to reach its decarbonisation target by 2050, then its climate ambition for 2030 needs to be sufficiently demanding, aligned with the European ambition. In this regard, the Spanish Climate Change and Energy Transition Law sets an emissions reduction target for the year 2030 lower than the EU’s that jeopardises the fulfilment of the commitment to becoming carbon neutral no later than 2050, as set out in the same law.

In addition, it is important that the new requirements are transposed with clear milestones and that their effects are felt in the remainder of this crucial decade and achieved by the year 2030.

Thus, both the regulatory and non-regulatory instruments must be transposed at national level, on time and avoiding the delays that we have seen with certain standards which have led to the postponement of key measures meant to pave the way to hitting the targets set. At the autonomous community level and because of the distribution of competencies in Spain, the transfer of these instruments to this regional scale must be based on consensus and joint work to ensure a quick and successful implementation.

To achieve all of this, sufficient economic resources are required. In this regard, the Spanish Recovery, Transformation and Resilience Plan provides an appropriate basis, with relevant resources for building, especially renovation, until 2026. This financial package must seek continuity in order to cover, not just what has until now been a clear priority, but also to introduce the forthcoming ambitious and complex proposals to come, both in relation to environmental challenges as well as social and economic ones.
Funding in the building sector
   Funding as the backbone of supply and demand
   Sustainable finance taxonomy: a change in the sector’s paradigm

The sector and sustainable funding
   Public framework: funding the national transition strategies in the building sector
   Renovation, decarbonisation and social impact

Stakeholders
   ESG funds and investors
   Traditional funders

Financial instruments and products
   Green, social and sustainable bonds
   Sustainable, green loans
   Products for homes and SMEs

Structural challenges in the area of funding
Funding in the building sector

Funding as the backbone of supply and demand

Both building and funding are going through a disruptive moment in time, where major changes are expected in asset valuation, in demand and the regulatory and financial framework.

The financial world has a huge presence in the building sector, since market goods are costly and most potential buyers cannot afford to pay for them without financial support. As a result of this, transactions usually require the buyer to use financial institutions to undertake and spread the payment over time.

The building is usually used as a property guarantee, meaning that financial products have a specific business model. This is the case with a house, mortgages are essential asset for a household, which makes them the sector’s main product, but also its main financial burden.

Thus, the financial world is particularly relevant to the building world compared to other sectors and is emerging as a key player in ensuring the sustainable transition of the housing stock.

And it is not just impacted by changes in supply and demand, as its strategic importance has brought it into the view of other stakeholders seeking to influence the sector’s socio-economic model, such is the traditional case of the regulator, the ESG (environmental, social and governance) criteria and taxonomy.

As it currently stands, both building and funding are going through a disruptive moment in time, where very significant changes in asset valuation, demand and the regulatory and financial framework are expected in the drive towards the sustainable transition.70

We must highlight that we treat the sector holistically in this chapter and it does not only refer to residential housing but also includes the building challenges in the public and private sectors.

70 https://gbce.es/evento/taxonomia-el-nuevo-marco-para-la-financiacion-inteligente/
Finance figures in the building market

**Prices and Affordability**
Since 2015, new houses have become more expensive: the growth in the HPI for new homes (+39.3%) exceeds that of wages (+5.6%) and the CPI (+27.8%).

**Rent**
Spaniards are renting 4 pp more than in 2010, reaching 25%. Almost 50% are struggling to pay for their home.

**Debt**
The main home accounts for 63.7% of household debt.
The percentage of homeowners in Spain (76.3%) is much higher than in Germany (61.5%) or France (66.1%).

**Financial Instruments**
According to Eurostat, 30.3% of Spaniards have a mortgage, one of the highest percentages on the continent. In order to meet the new needs of the sector, new products are entering the market.

**Risk and Interest Rates**
The rates remain low and are far behind levels of a decade ago with the support of the ECB.

**Renovation**
With a building renovation rate of 0.1%, Spain is lagging behind the renovation targets of 2 to 3%.

**Transactions and New Builds**
Transactions have returned to pre-pandemic crisis levels, but remain far from what they were before the property bubble burst.
Companies are consolidating their new role in the market, accounting for 10% of sales and purchases.

Drafted by the authors, Green Building Council España (2021) based on the Annual Wage Structure Survey, the House Price Index, mortgage and interest rate figures (National Statistics Institute, 2021), the House Rental Price Index State System and transaction data (Ministry of Transport, Mobility and Urban Agenda, 2021).
Sustainable finance taxonomy: a change in the sector's paradigm

The spotlight that the recovery is shining on the sustainable transition will accelerate the trends that have been predicted since 2019, the year in which the first EU sustainable finance taxonomy document was published. The taxonomy seeks to create a classification of the Activities that make a substantial contribution to the EU’s sustainable development goals under specific criteria to standardise what is considered sustainable.71

The EU’s aim will be to redirect financial flows to activities considered as “green”, using the financial system to create a domino effect to generate a transition in the rest of the economy.

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71 EU Taxonomy Study, GBCe (2021)

Financial implications of the EU taxonomy

<table>
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<td>CONSTRUCTION OF NEW BUILDINGS</td>
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**GENERAL REQUIREMENTS**

- Buildings must be more energy efficient and integrate locally generated renewable energy. The requirements for new builds are higher than for all other activities, so they are expected to be an energy efficiency lever for improving housing stock.

**IMPACT**

- Renovations will be audited and must meet quantitative objectives, which is why the taxonomy sets the target to which renovation measures concerning energy efficiency should aspire.

**NCEA**

- Building construction and specialised construction activities (NCEA) P41 and P43

**BUILDING ACQUISITION AND OWNERSHIP**

- Buildings constructed before 2021: The efficiency of the building must be within the top 15% of the housing stock. Buildings constructed from 2021 onward: The same requisites as “new builds.”

**INVESTMENT**

- Investment flows will be channelled mainly through acquisition. Thus, the taxonomy is expected to increase the price differential between the sustainable buildings and those that do not meet the listed requirements. The will encourage both sustainable criteria and renovation measures to be integrated into construction.

Source: Drafted by the authors, Green Building Council España (2021) through the EU Taxonomy Study, GBCe (2021) and the European Commission.
The taxonomy is accompanied by other political and regulatory measures, such as the Renovation Wave as part of the Green Deal, the EPBD, the EED and the Governance Directive or the Fit for 55 Framework\(^\text{72}\), etc. Nationally, European commitments are articulated through the Spanish Climate Change and Energy Transition Law and the NECPs. The long-term impact of the EU’s budget and the NextGenerationEU’s recovery funds, which in Spain are communicated in the Spanish Recovery.

Transformation and Resilience Plan and España Puede, will be able to accelerate the process of integrating taxonomy and sustainability into the sector’s financial model. This means that funding is going to have an even greater importance than it has had until now, and may foster the integration of ESG criteria into new buildings and accelerate renovation as a vector for the energy transition.

However, for this to happen, we must address the current challenges:

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**The fledgling integration of sustainability into the financial world**

Standardised criteria and products must be designed.

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**Size and variability of renovation interventions**

The investment will require a degree of typification and aggregation in the renovation measures.

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**A huge investment is forecast**

The investment is a challenge in and of itself, since its organisation depends on the different communities, the management of processes and the capacity to prioritise measures that have the greatest impact.

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**High technical grade in aspects of sustainability**

One possible way to tackle this challenge by dissemination and information is by providing better training.

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**Lack of statistical reference information**

Work needs to be done on new data capturing processes and transparency requirements.

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**Need for an increased level of private funding**

Collaboration, public-private partnerships and financial mechanisms to ensure that public money leverages a much higher volume of private funding.

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Source: Drafted by authors, Green Building Council España (2021)
The sector and sustainable finance
Public framework: funding the national transition strategies in the building sector
Renovation, decarbonisation and social Impact

According to the Spanish Ministry for the Ecological Transition and the Demographic Challenge, 82% of buildings in Spain are inefficient and it is calculated than half of the homes were built without any specific efficiency standards. With building renovation rates between 2 and 3%, the European energy efficiency and renovation targets could be reached, but in Spain the rate is around 0.1%. Taking into account that the aim of the Renovation Wave is to double the building renovation rate, Spain’s low initial rate means this target is far off real renovation needs.

Thus, raising the ambition of the renovation rate and promoting the decarbonisation of assets is fundamental and it would avoid large opportunity costs, but the high investment needs pose a significant financial barrier.

National public funding instruments related to improving energy efficiency and sustainability and other programmes run by the autonomous communities already exist, but the scale of the volume of investment in renovation measures will be unprecedented and accelerated by the Recovery Funds. This financial stimulus is expected to have an impact on the labour market due to the sector’s capacity to generate jobs and economic activity. And according to different sources, 250,000 dwellings per year would stimulate the labour market, creating 135,000 direct jobs, and for every million euros invested in the construction sector in Spain 18 jobs are generated.

74 Infrastructure and Urban Planning Commission of the Spanish Confederation of Business Organisations
75 Homu Project https://homuproject.com/Libro-verde-digital.pdf
Sustainable finance has been a major player in the financial market in recent years. In Spain, the total volume of the sustainable finance market reached 3.026 billion euros in 2020, with a year-on-year growth of 45%. According to the IFC, sustainable buildings represent an investment opportunity of 880.7 billion dollars in 2030 in Europe, 60% of which will go towards the residential sector.\textsuperscript{44}

At present, investment in sustainable building stands at 423 billion euros globally, although it barely represents 8% of the total investment in building construction and renovation.

\textsuperscript{44} Green Buildings A FINANCE AND POLICY BLUEPRINT FOR EMERGING MARKETS, International Finance Coorporation, IFC

In a context which forecasts public-private investment of 83.54 million euros in savings measures and energy efficiency and 91.765 million euros in renewables as part of the NECP, the main players in the building sector’s financial markets have started to integrate ESG aspects into financial investments.\textsuperscript{76} And an allocation of 11.622 million euros of public funds and a total investment of 32.435 million euros is expected to go towards the building sector. In addition, according to the LTRS and the Spanish Recovery, Transformation and Resilience Plan an estimated 7.1 million homes will be renovated before 2050.\textsuperscript{77}

This process will result in sustainability being included in the traditional risk-affordability ratio when it comes to decision-making. The impact of the EU taxonomy is expected to standardise and drive this type of funding in the sector, as well as the criteria taken into account by the markets.
Stakeholders

**ESG investors and funds**

More and more market stakeholders are integrating sustainability into their corporate purpose and decision-making. Impact investing funds are a good example. They seek investments that generate a quantifiable return in economic terms, but also on in social and environmental terms. A large number of traditional financial institutions have positioned themselves in this segment and have made commitments to combating climate change and to delivering the 2030 Agenda, which is why they have started to develop energy renovation and green mortgage products, and have taken centre stage in the bond market and sustainable loans.

**Traditional funders**

Due to the nature of investments in the energy efficiency of buildings, which require a substantial initial outlay but then lead to savings for the rest of the useful life of buildings, traditional institutions like pension funds or asset management companies can, over the long term, find market opportunities that provide profitability. In addition, it’s worthwhile pointing out the impact that other sector stakeholders have such as citizens.

**ESG analysts: Who are they? How do they assess the sector?**

Although the importance of sustainability has become apparent in financial operations, much of this is driven by the new ESG stakeholders. In this regard, ESG analysts have been put in charge of establishing the best practices and requirements for considering a company as sustainable. Although at the start, the work of these analysts was limited to assessing the performance of the companies in the sector, their current role goes beyond that and they are part of financial operations as providers of second-party opinions, i.e., as verifiers of the degree of sustainability of sustainable financial instruments such as green bonds and sustainable loans.
Financial instruments and products

The new instruments that we have seen in the sustainable finance market are green, social and sustainable bonds, but there are other instruments that may gain more ground over the coming years.

Green, social and sustainable bonds

Green bonds are financial instruments that aim to raise capital to invest in projects with environmental benefits. For a bond to be eligible as a green bond, capital must be used for renewable energy, energy efficiency and the circular economy, etc.\(^{78}\) Furthermore, green bond issuers must ensure that resources are managed properly and report any information on the development of the projects carried out. To regulate these types of instrument, the EU is working on an international green bond standard, the adoption of which is expected in 2021.\(^{79}\) As part of the European Green Deal framework, the EU expects that this type of investment will be extended, in accordance with the criteria defined by the technical expert group.

Green and sustainable loans

Green loans are loan instruments whose performance is linked to indicators that reflect a company’s environmental impact on its surroundings. If the loan recipient also seeks to tackle aspects related to other areas of sustainability such as the social or governance sphere, then the loan will be deemed sustainable.

Over the past year, these loans have grown by 38% in Spain, reaching 18.002 billion euros. Companies in the sector usually establish neutrality commitments, link financing to obtaining an energy performance certificate or link it to funding renovation and social impact projects.\(^{81}\)

In this regard, funders are ready to offer more favourable terms and conditions if the instrument helps to improve the sustainability performance of a company or property assets for the following reasons:


The regulator improves conditions on issues such as capital requirements.

The impact of these instruments on market expectations and on the perception of long-term risk.

The sustainable vocation of the so-called impact investors.

**Products for homes and SMEs**

Not all stakeholders can accelerate the bond market or opt for green loans linked to metrics determined by reference standards, but Spain has sustainable financial products for SMEs and homes.

Funding is intended new builds as well as renovation. In the case of new builds, funding is earmarked for acquisition of new property assets by households and companies, and sustainable products are focussing on linking environmental targets to financial metrics. As for renovation, we are seeing the emergence of unprecedented models in the sector with solutions that aim to ease the financial burden of interventions leveraged on the economic savings from energy efficiency.

An analysis carried out by AUNA reveals that the most innovative financing models are furthered by stakeholders specialising in the technical knowledge side of energy renovation projects. The platform highlights the impact that public-private partnership can have on financing over the long term, the usefulness of linking the debt to the property itself (asset-based finance), the need to develop rigorous energy savings measurement techniques to allow utilities to enter the market and the importance of risk sharing between the companies receiving the finance and the companies providing the finance.

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**AUNA alternative funding diagram in the case of renovation (2020)**

Private funding
A loan to the client from the energy company with a repayment made on the bill. Framework scheme for forfaiting comprehensive EPCs (ESCO) purchase and sale of contracts covering.

Crowdfunding

Private-public partnership
Property loan with tax repayment (SECAP model)
Green Bank model
Public guarantee mechanisms

Private investment
Selling energy efficiency as a service
Selling metered energy savings

Public funding
Full tax deduction (Superbonus 110 percent model)
Public funding with future energy savings

Structural building challenges in the area of funding

In addition to changing the paradigm, the sector must fix its structural problems. A challenge that needs to be overcome is the footprint of the 2008 financial crisis on the sector. Both the supply and demand lead to imbalances caused by the economic downturn. Similarly, financial institutions and the public sector continue to hold property assets on their balance sheets that demand has not been able to absorb. Structural economic difficulties have been compounded by a slump in demand.

A considerable portion of the financial sector is expecting a revival, but the recovery plans and public investments are facing the funds absorption challenge. Therefore, if public funds do not manage to increase demand, then public authorities will end up dealing with a debt problem. Structural challenges play a part in the low housing stock renovation rate, but also in the need to reduce the dependence on fossil fuel infrastructure.

In this case, including sustainability metrics in funding could accelerate the sustainable transition of homes and other commercial property.

However, not all structural challenges are environmental. In fact, one of the largest financial obstacles the sector faces are the indirect costs and bureaucratic procedures that come with building transactions and measures.

Furthermore, according to the Ministry of Transport, Mobility and Urban Agenda, another challenge to overcome that would expand renovation is neighbourhood-level measures due to the scale of the investments. This challenge will have to be addressed jointly with the support of city councils and public authorities, especially in areas where buildings are in a poorer condition or where there are vulnerable population groups with fewer socioeconomic alternatives to commit to refurbishment work.

The massive injection of funds into the sector is a challenge in and of itself. In this case, the risk associated with this measure is that the allocation of funds is inefficient and that poor financial coordination prevents the environmental and social objectives of the financial aid from being fulfilled. Companies in the sector must be prepared to undertake a large number of projects and the country’s economic activity must enable the demand to cover the financial aids and to implement house renovation and refurbishment plans, plus include ESG criteria in the acquisition of new homes.

By the same token, increasing the stimulation effect of public funding in private investment will be key in reaching the number of renovated homes per year. Therefore, reducing the weight of public funding in the total investment will be one of the most important aims over coming years.
The challenge of scaling renovation

Dolores Huerta
CEO of GBCe

Over the past 12 years, renovation has become an important move in the building sector to help reinvent it after the property bubble burst in 2008. However, even though both the public authorities and the sector itself realised it was a priority matter, the real interventions to improve the state of Spain’s buildings have been in their minority.

There are plenty of pilot schemes, many of which are well funded by EU projects, that showcase the virtues of comprehensive renovation: the improved health and comfort of users, reduced energy expenditure and therefore lower GHG emissions, the generation of local employment not at risk of relocation, etc. None, however, have found the key to scaling up and making widespread an activity that the European Commission acknowledges as a priority in the New Green Deal, by way of the Renovation Wave in order to decarbonise Europe by 2050.

The crisis brought on by COVID-19 has become the black swan that gives us a golden opportunity for renovation, to become the flagship of a new, resilient and decarbonised economy driven by Next Generation Funds. A historic investment of almost 7 billion euros over the next 5 years that will test the sector’s capacity to provide a professional response with guarantees, and to generate, maintain and increase activity once the funding is withdrawn, as envisaged in the Long Term Renovation Strategy. A decisive five years to generate the management and funding tools necessary, to train up professionals and labourers and to demonstrate and communicate what we can do.
On the other hand, the EU’s commitment to the Paris Agreement, aware of the urgency to act over the next 10 years, is now entering an acceleration phase. The European Climate Law safeguards the target to reduce GHG emissions by 55% by 2030. For this reason, a revision of the European Energy Performance Buildings Directive includes incorporating Minimum Energy Performance Standards (MEPS) from 2027. This milestone marks for the first time a date from which buildings and houses with a poor energy performance certificate cannot be sold, bought or rented. It is, without doubt, a clear message to society warning that we are all responsible for decarbonisation.

These enforcement measures must be accompanied by support for citizens to plan for works in their homes, and to turn necessity into opportunity, if we don’t want to end up living in a Europe of ‘yellow vests protests’. This transformation will only be possible if we adhere to the motto of not leaving anyone behind.
Innovation
Innovation as a lever for the sustainable transformation of the sector

Changing the sector through sustainability
  The technologies used
  Innovative industries becoming sustainable
  New business and financial models

Where do we go from here? Opportunities to accelerate the change
Innovation as a lever for the sustainable transformation of the sector

Innovation is usually motivated by competition. It happens in all sectors, even building. Today sustainability is helping to increase competitiveness more and more, and as a result, it is driving innovation.

Innovation means creating or modifying a product and putting it on the market.\(^8\)  
\(^8\) Meaning taken from the Royal Spanish Academy (RAE)  

In addition, innovation is divided into multiple categories. Normally, they are divided into\(^8\):

- Supply, focused on products and services
- Processes (idem experience), focussed on management and production
- Market launch, focussed on sales and marketing
- Structure (idem set-up), focused on business and organisational models.

Main innovations

A lever for sustainable transformation of the sector

Source: Drafted by the authors
Green Building Council España (2021)
The 2008 financial crisis, climate change and the socioeconomic crises of the last decade have forced the whole building value chain to begin a process of adapting to the change, where a more competitive, more integrated, more dynamic and more sustainable model is sought. How to respond to these challenges through innovation, and how to do it in an integrated and accessible way, is one of the main concerns.84

According to the European Construction Technology Platform,85 to achieve sustainability cross-disciplinary work is needed on driving and adopting technologies that improve the capacity of all sector stakeholders to work together in a shared digital environment, which can be accessed and understood by all. Although digitalisation helps each innovation in sustainability, the burden really falls on the change in the production model, from linear to circular models, in which the improvement of processes, the change of relationships in the value chain and innovation in industrialisation play a key role.

Driven by the challenges of sustainability, innovation in the building sector covers a very broad spectrum from design using tools that can forecast the environmental footprint of projects to the construction process, including industrialisation and digital environments common to the entire value chain, such as BIM; market launch, PropTech (name given to the niche area of start-ups that assist in property development) as a launch pad for real estate, plus the use and life of the building, with technologies and tools that facilitate responsible use of resources and energy.

Though still germinal in some cases, there is a wide range of solutions. Business activity reflects this positive, yet slow evolution, with 2018 being the first year since the recession to see companies carrying out in-house R&D experience strong growth. However, the contribution of SMEs to total business investment compared to 2008 is still 7 points lower, dropping from 54% in 2008 to 47% in 2018.86

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84 https://ec.europa.eu/docsroom/documents/45647
85 https://plataformaptec.es/
Changing the sector through sustainability

The technologies used

The application of new technologies in the sector is marked by a major need for data acquisition, management and analysis and their integration into all phases of building construction, from design and planning to monitoring throughout the lifetime of the buildings.

Their development and use would not just help to improve and make efficient many processes, but also to generate new relationships between stakeholders, where all can participate at the same time.

Building Information Modeling (BIM) Methodology

One of the most important innovations in the building sector and across all construction and renovation in general, is the use of collaborative design models. Building Information Modeling (BIM) methodology garners special relevance in this field, and although it is still far from becoming widely implemented in the sector, it is being used as a driving force by the public authorities as well as large- and medium-sized companies in the industry.

Its use is enabling all building stakeholders to coordinate and become informed of the construction and renovation process thanks to the management of building data provided at each of its phases, which are shared by each of the stakeholders involved and added to the same platform, which can be accessed by everyone.

BIM presents major opportunities for the sector’s sustainable transformation: it facilitates the process of energy performance certification and any other impact; it provides a single tool to undertake a life-cycle assessment (LCA); it can be used as a basis for LEAN Construction processes; and, last but not least, it is going to radically transform the relationship between all the stakeholders in the value chain, bringing together the information they receive and providing unique shared information pathways and a shared language for all.

This methodology has used in the Spanish market for over 10 years and there are companies specialising in providing support or help to use it. Despite increasing standardisation, its implementation is still rare.

In 2018, the Spanish Ministry of Public Works set up the Commission to implement the BIM methodology and since 2019 all invitations to tender have required this system to be used. If in 2017 only 1 out of every 10 BIM invitations to tender were for infrastructures, it was 5.8 out of every 10 in 2020.44

Spain is starting off in a tentative position: barely 30% of the sectors companies were using BIM in 2018, if we compare it to surrounding countries like the United Kingdom or Germany — two of the first countries to implement BIM —, where an estimated 70% of companies in the sector use it.87

As a result of the use of BIM, a digital twin is expected to be developed. It is virtual representation of a physical object or system throughout its life cycle, the more complex version of a connected building model that offers information about all the systems integrated into the smart building in real time, reaching a high level of fidelity to reality, autonomy and automatic learning capacity using the data it generates.

Smart buildings and the Internet of Things (IoT)

The smart home era is now here. Apps to control lights and heating, activate your alarm or switch on the washing machine are more and more common. The Internet of Things (IoT) for buildings has emerged as a growing market. The agency Berg Insight anticipates a 35% penetration of this industry in Europe over the next four years. Smart buildings do not just involve advances in home automation, but also in real time consumer data management.88

This is a huge step forward, since smart buildings could provide a constantly updated management database, where BIM could be applied to maintenance and could even be connected to the building's digital book to make this all this data accessible to users.

Thanks to this new type of connected building, reports with data can be drawn up for users, and therefore they can gain a more detailed understanding of the use of the building and its impact. In Spain alone, it is expected to grow 300% by 2024, i.e., 20% of homes will have at least one connected device. Forecasts are still below those of other European countries such as Germany, where home automation is being rolled out in 60% of newly built homes.89

87 https://www.planradar.com/gb/bim-adoption-in-europe/
Smart cities and big data

Within innovation one of the most important disruptions is the use of big data on an urban scale, being applied to so-called ‘smart cities’. They are based on the intensive use of information technologies to develop new models for managing large cities, which can analyse and manage data on a whole host of topics: the economy, mobility, environment, population, habits, administration, etc.

Smart cities lead to town planning becoming digitalised. Spain is one of the European countries to have a Smart Cities Plan to foster “the creation of pleasant and attractive urban settings for tourism and that are business entrepreneurship-friendly, according to Red.es, a public agency belonging to the Ministry for Economy and Business support for the Digital Agenda for Spain, and adds that this plan has earmarked 188 million euros.”

Virtual and augmented - that’s how the property world and construction management is transforming the property market and building works management

Thanks to virtual reality, an immersive form of a project can be previewed before the project has even been built. In addition, the evident commercial application for property sales, these types of simulations makes it easier for owners and users to be involved in decisions concerning the project. Another application involves the chance to preview construction processes, or to obtain simultaneous in situ information during construction through augmented reality, enabling a reduction in errors and the optimisation of these processes. Integration with other tools like BIM, which provides the virtual 3D environment where the visualisations can be created, will make it easier to use. Furthermore, the number of virtual reality companies has grown 80% since 2017.

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The use of drones is another example of innovation that is increasingly being applied in the sector. In fact, construction is the industry that currently uses the most drones in the world.\(^2\) It has many possible uses: surveying tools, 3D building and land generation tools, for measuring environmental indicators (air quality, water quality, etc.) or to provide building monitoring and quality control —with the possibilities that arise along with augmented reality—. Along with aerial photography and filming, surveying is an activity that 96% of drone operators are involved in in Spain.\(^3\)

**Blockchain**

The traceability and veracity of data are crucial in the sector, why is why blockchain is an important technological to bear in mind. The decentralisation and encryption features of blockchain provides contribute to transparency. It's a trust building tool that allows all management information to be recorded during the life of the building and then verified. One possible use of blockchain is that it can be applied to reliably track all the work undertaken, equipment and material information —facilitating the development of the LCA—, the stakeholders intervening in each phase, maintenance operations, etc, while guaranteeing data transparency, privacy and security and that information won't get lost after being handed over.

Another major contribution of blockchain will be the introduction of smart contracts. These smart contracts are self-executing once the recorded agreements have been fulfilled, facilitating and ensuring the performance agreed by the parties. Contract automation in the building sector will accelerate proceedings, facilitating legal and security processes between the partaking stakeholders.

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Innovative industries can be sustainable too

Because of growing awareness around the importance of sustainability, the sector’s industry is having to reinvent itself. Organisations responsible for design, execution, manufacturing and management are evolving to respond to the new needs around climate, economic and social challenges.

Changing the model: from linear to circular

With the spotlight firmly on the circular economy, methodologies such as the life-cycle assessment (LCA) help to evaluate environmental impacts. This methodology assesses products and materials from a environmental impact point of view, unlike the usual purely economic and short-term focus on the market. 94

For buildings to achieve a circular life, it is not only necessary to consider the waste they generate, but also to take into account the products used in a building as a material bank for future constructions (cradle-to-cradle).

The LCA methodology is accompanied by the need to create a national environmental impact database for materials, which underscores the importance of the availability of manufacturer data and its implementation in BIM models.

Therefore, it is important to offer incentives for innovation around this methodology, so we can trace the environmental impact calculation (facilitated by blockchain technology). The opportunities provided by these technologies and methodologies, such as BIM, blockchain and LEAN are complemented by other research processes such as the development of prefabricated elements and new materials, and products that do not only foster circularity, but can also have a positive impact on the environment.

The drive behind "eco-Industrial development"

Industrialisation is one of the major opportunities for sustainable innovation. Modern robots execute a wide range of construction procedures that ultimately enable processes to be optimised and streamlined, such as the mechanisation of hazardous tasks, the assembly or installation of products, as well as the manufacture of complex components (3D printing).

A process inherent to this industrialisation is the design or use of prefabricated elements. In the case of buildings that are completely prefabricated, although they are becoming increasingly widespread, their application remains modest, not exceeding 1,000 homes per year, the majority being single-family homes and high-rise buildings.

This implies that the industrialisation of the entire building sector still only has a slight impact on improving the sustainability of the sector.

Despite its advantages, in Spain this type of innovation accounts for only 1% of total construction, a figure far removed from other European countries, such as Holland (50%) and Sweden (over 90%).

Perhaps industrialisation’s clearest contribution to sustainability is that it makes it easier to recover materials, propelling the sector’s circular economy. Sustainable and cross-disciplinary industrialisation in the sector will not only entail improved productivity, but also greater efficiency in the use of resources and the incorporation of more sustainable materials, such as wood, into processes. In relation to the impact of materials, 49.2% of construction companies in Spain stated in 2018 that they used recycled raw materials or recycled material in their production process, and 44.3% said they used materials or products that that come with a certification scheme, but we are still a long way off reaching the impact reduction figures sought by the European Union. Furthermore, it would also help to scale up the use of some “eco-materials” and facilitate their implementation, which would otherwise require specialised labour or costly lead times.

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New business and financial models

Systems that transform the relationship between stakeholders stand out as one of sector’s innovations. This means integrating a sustainable vision throughout the whole value chain, even beyond the useful life of a building. It concerns the evolution construction processes, such as LEAN Construction, but also collaborative innovations, such as IPD contracts or a digital building passport.

LEAN completely transforms the relationship between the stakeholders in the chain, allowing projects to be upgraded early, collective negotiation of the targets to be reached, including sustainability targets, and lifelong learning for all the members.

The LEAN Construction methodology

One of these models is the well-known LEAN system. To optimise production, this system advocates for the elimination of elements that do not add any value to the project, using as few resources as possible. This often meaning that adopting the LEAN method involves modelling systems, such as BIM.

While in the traditional model each of the stakeholders in the chain intervenes at different phases, collaborative planning provides a cross-disciplinary view of the process among all the stakeholders, from design to its subsequent operation. This model completely transforms the relationship between the stakeholders in the chain, allowing projects to be upgraded early, collective negotiation of the targets to be reached, including sustainability, and lifelong learning for all the members of the project.

Contratos IPD, integrated product delivery

One of the tools that bring to fruition this new relationship between stakeholders are IPD contracts, also known as “collaborative contracts”. These contracts seek to leverage the capacity, talent and interests of all the stakeholders in the chain from the very beginning. Their intention is to standardise the criteria in the management of the process and people involved in order to optimise the results and increase the value and efficiency of the whole process, sharing sustainability targets.

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Energy Performance Certificates or EPC

Innovation in funding and the development of energy efficiency solutions have become crucial in the quest for a solution to the pressing need to upgrade the energy efficiency of the housing stock in Europe and in Spain, linked to difficulties accessing the funding necessary to carry it out. To deliver it, new contracting models between users and energy service companies (ESCOs), which include new funding systems, have emerged over recent years. These new contracts are known as performance or EPC (engineering, procurement and construction) contracts and they agree to outsource the management of the building’s energy resources.

Façade leasing

The building envelope is one of the parts of a building with most impact on its energy efficiency, the cost of the building’s life cycle and the comfort of its users. In this regard, façade leasing or “servitisation” offers an opportunity, as stated in The Façade Leasing Pathfinder, cofunded by the European Union and headed up by the Faculty of Architecture of TU Delft University and the Climate-Kic business consortium. Façade “servitisation” comprises a business model in which the users are no longer the owners of the building envelope, instead the envelope and its integrated services are supplied by a provider through a performance contract (EPC).

This model could help to advance circular economy strategies for the reuse and prefabrication of building components, as the providers of these services will have to take responsibility for the materials once the contract ends.
Digital building passport

Another service associated with new technologies and data access that is gaining momentum is the digital building passport, provided by public authorities and developed by private organisations. This passport is intended for users and it aims to make real and proven information on each building accessible to them, offering information on the building’s impact on the environment and on health throughout its whole life cycle.

This shared repository of information about the building will help to foster transparency in the sector and combat general user ignorance, which would significantly help with the renovation of the built environment. 100.

The user would learn to interact with their building in a useful way and know its needs at all times —whether safety or quality— both now and in the future. It could also monitor in real time how it uses the passport, through home automation and the Internet of Things (IoT).

Startups and business models: ConTech and PropTech

An innovation field associated with new technologies has shot up due to the emergence of niche startups directly linked to the following sectors: PropTech (property market management) and ConTech (application to the construction process). These business models are a vehicle for the development of new technological and digital solutions, and offer up an economic opportunity for these solutions to be associated with sustainability. The evolution is enormous if we consider that at the start of 2017 only 58 national tech companies in the property sector were identified and now Spain is the fourth country with most PropTech in Europe, with more than 270 companies. 101.


101 https://www.elmundo.es/economia/vivienda/2017/04/14/58ee4918ca4741494a8b4681.html
Where do we go from here? Opportunities to accelerate the change

Innovation is a lever for sustainability, an increasingly necessary method for responding to growing and diverse challenges, but also for developing socioeconomic and environmental opportunities in the sector over the coming years. Over the short term, it is expected that many of the innovations mentioned herein finally see their implementation become a reality in Spain. This is what the forecasts predict, particularly considering the implications of the new European reference frameworks —such as the Renovation Wave or Level(s)—, and their adoption at national level, which would make way for a change at all levels, from project funding, to the execution and monitoring of the life of buildings.

This is how innovation in the sector fundamentally relies on collaboration between stakeholders and scalability to develop solutions that integrate new technologies, for new industries through new business models.

Even though innovation in the area of sustainability is growing in Spain, the implementation rate of new tools or processes is still low. Insufficient investment capacity, a lack of digital transformation strategy, a scarcity of resources and a lack of skilled profiles are major barriers for almost one in three Spanish companies in the construction sector, according to the survey carried out by the Spanish Construction Technology Platform.

But how will the sector go about it? When it comes to such a complex question, there are many answers.

The boost from the recovery funds is expected to provide an incentive for companies, but it is not yet clear whether they will be able to cope with the growth in demand for such solutions.

There are major challenges to be overcome in the short to medium term, such as the disconnection between the world of training and the world of work, where there are major shortcomings when it comes to finding qualified staff who know how to work with these new business models or apply certain methodologies and tools.

As the COTEC Foundation explains, the combination of a high student dropout rate at an early age and the high percentage of young people with university degrees creates a bottleneck for the implementation of innovations. Investment in new forms of training is essential if Spain wants to make progress with the sector’s sustainable transformation. Widescale awareness will also be decisive when it comes to securing these innovations. Even though society is becoming increasingly aware of the impact of construction, this awareness still has not translated into a call to transform consumption habits. This is why we need to bridge between the gap between the real impact on our life and surroundings, thereby making it easier for users to play an active part in the sector’s transformation.
Communication
Communication as a lever for change

Sustainability in public conversations
Construction, the topic that generates least interest and the institutions that trigger most discussion

Sustainability and building, a pairing with momentum
Renovation of housing at the heart of the conversation
Climate Summits, Paris Agreement, Coronavirus and other milestones to foster the development of sustainable building
Renovation as a way towards sustainable building

Sustainability and housing are not trending topics for politicians

There’s still some way to go

Appendix: Methodology followed for the analysis conducted in the chapter “Communication”
Communication as a lever for change

Communication in all its forms has helped us evolve as a society, to democratise, share and bring trends, ideas and concerns to an ever-increasing number of people. The media is a loudspeaker for what goes on in the streets, in politics and on social networks, too. And the media plays a dual role: it is the active and passive stakeholder when it comes to bringing about change.

On one hand, it amplifies and raises awareness of the issues and concerns that only a small portion of society knows about. And on the other hand, it jumps on the bandwagon of popular trends encountered in the street or on social networks so as not to miss out on the news. In the case of sustainable building, only a small portion of the population is aware of it, so placing this narrative at the heart of the conversation on sustainability and climate change is one of the main levers necessary for generating a shift towards a more sustainable building model.
Sustainability in public conversations

Food, sustainable development, innovation and arable farming are some of the topics that are currently generating most interest among the public. And, of course, this is also reflected in the way social networks and the media portray these topics of conversation.

Even so, despite the fact that social media often mirrors the communications in online media, there are certain differences when it comes to sustainability.

In the media, 20% of the headlines focus on the initiatives institutions take to improve sustainability while half of the conversation featured online in the month of July 2021 is divided between purely business matters and green issues.

When it comes to the media analysed, from the popular press to economic supplements, including regional media and online trade press, they all show an interest in sustainability, though they certainly don’t go overboard.

For this analysis, a methodology has been used based on extracting data from the social network Twitter and following 820 online popular press accounts and 69 publications specialising in sustainability and construction. In Twitter, the data has been extracted using tools called Tractor and Graphext. This network was chosen due to the privacy limits on other social media networks. Using media listings and keyword combinations to cut through the noise of the conversation and keep only what is relevant.

All the information compiled and analysed comes from an analysis of the content about building and sustainability, including other terms like construction, energy efficiency and poverty, architecture and engineering in the search.

However, these searches do not necessarily cover the full spectrum of terms used by the media and by users. We are aware of the fact that this is an analysis of a small portion of the whole conversation on a specific channel and in a specific period of time (from January 2015 to October 2021), with all the limitations that it entails.
Construction, the topic that generates least interest and the institutions that trigger most discussion

At present, the debate on the building-sustainability pairing remains relevant only for a small percentage of the population since only 4% of the publications on social media belong to this segment.

This is a very conclusive piece of data that raises awareness of the relevance of the debate on sustainable construction within all the publications and shows that it is a residual discussion.

The same lack of interest in this topic can also be seen in the popular press, where only 3% of online news compiled is about sustainable building, and when it does hit the headlines, it focuses on the renovation of homes and buildings to gain greater energy efficiency, without linking specifically linking it to climate change.
Sustainability and building, a pairing with momentum

Renovation of housing at the heart of the conversation

The presence of the term sustainability in conversations has increased exponentially over recent years, above all, thanks to movements like Fridays for Future, headed by the young activist Greta Thunberg. In addition, the pandemic has accelerated many trends and the quest for sustainability in all its forms is one of them. In terms of figures, over the past 6 years more than 53,000 tweets and more than 9,000 online media articles addressing the sustainability of buildings and the future of cities have been recorded.

However, in the media it wasn’t until 2019 that the conversation volume on this topic grew significantly louder, while on social networks the biggest increase was seen from May 2020. So much so that 90% of the sustainability-related impacts in the media happened from February 2019 and 18% of the tweets published on building and sustainability were in the first 8 months.

10% From 2015 to 2019
90% From 2019
These figures make it easy to discern how this topic has found its way into collective ideals and has gradually established itself as a new element in the social debate, although, as we have seen, there is still a long way to go to achieve widespread recognition for the key role that sustainable building plays in the future of life on the planet. Having said that, what do we actually mean when we talk about sustainable building?

The main topic of conversation online revolves around renovation, whether it’s institutions encouraging it through economic aids or though the drive to improve public infrastructures.

We see consistency between the topics that are addressed in the media and on social media networks as everything related to town planning, heritage renovation and state aid is of interest to journalists. In saying that though, generally speaking there is no link between renovation and the quest for sustainability. Instead, a greater focus is placed on the quest for energy efficiency.

The Urban Agenda, energy efficiency and climate changes are the other axes around which the online conversation revolves, although their presence is less significant. This does not mean that these topics are not of interest, as we are talking about sets of publications that amount to between 3,000 and 10,000 tweets approximately between January 2015 and July 2021. So, we are dealing with publications that address issues that are relevant among the population, above all energy efficiency, which is addressed in 17% of all the publications compiled.
We can conclude that the role that institutions play is key when it comes to generating a debate on sustainable construction. It is the public institutions and associations that ignite the debates that subsequently reach society, and they should be at the forefront when it comes to adapting to the future and leading it.

In the media, there is a huge difference in topics if we distinguish between the regional and national media.

It is hardly surprising that local media focuses more on all renovation works on the area’s heritage or in its city, as well as the economic aid or investments made by departments or the city council to renovate houses, while the national media zeros in on more traditional concepts linked to sustainability, such as climate change, energy efficiency and the circular economy.
Distribution of the topics published in the media about sustainability in construction according to location (2015-2021)

It is important to underline that only 0.6% of the impacts that address renovation and building includes direct mentions of matters relating to sustainability in their headline, a figure that drops to 0.1% when it comes to direct mentions of climate change.

As happens with the general curve of impacts in the media, the one that corresponds to the topics around renovation increases exponentially from April 2019, seeing the highest peak in publication between October 2020 and January 2021. It is striking that Castile-La Mancha is the region where the highest number of impacts have been published since the start of this analysis in 2015.

In fact, the most mentioned politicians are Nacho Hernando, Councillor of the Department of Public Works of the Government of Castile-La Mancha, and Emiliano García-Page, President of the Junta of Communities of Castile-La Mancha, which demonstrate the region’s keen interest in this topic compared to the rest of the country.

With regard to the trade press, no close link between house renovation concepts and sustainability has been observed. Generally, housing adaptation is more about energy saving and energy efficiency than caring for the planet.

In fact, of all the impacts located and published in the regional media (90% of the total) 92% address all aspects of renovation of housing and infrastructures, i.e., restoration of cultural property, construction upgrade and, above all, public aid schemes for the upgrading homes such as building adaptations.
In fact, 88% of the impacts compiled openly deal with housing, building and city renovation, although their link with the term sustainability is specific to only 0.7% of the cases, while 7% of the content about renovation is from an energy-saving point of view. It’s even more surprising if we look at more specific terms like sustainable development, sustainable architecture and sustainable city.

88% of the impacts compiled openly deal with the renovation of homes, buildings and cities, although only 0.7% of them are linked to sustainability.

In the first of the cases, it is present in just 0.2% of the headlines while in the second case this figure drops even further, to 0.1%. This only underscores the little importance that the sustainable-building coupling garners in general, as it doesn’t even receive the necessary attention in the sector’s own trade media.

**Time distribution of the topics of conversation on sustainability in construction**

- **Renov and institutional aids**
- **Infrastructure renovation**
- **Consultancy and info**
- **Housing renovation**
- **Energy efficiency**
- **Urban Agenda**
- **European funds**
- **Climate change**

Period: 2015-2021 Source: Twitter
Climate Summits, Paris Agreement, Coronavirus and other milestones to foster the development of sustainable building

What makes certain issues start to be discussed and become a central part of society’s conversations? These are very interesting questions to bear in mind when it comes to addressing and delving into the conversation about sustainability and building. Nowadays this is a topic that society is starting to take notice of and it is thanks to the crisis triggered by Coronavirus.

Evidently, this has directly affected the image of sustainable housing and the debate online around the same topic as it has seen a dramatic increase from May 2020. Furthermore, it is easy to find other elements that have contributed to the boom in this topic of conversation.

Sustainability and building, a subject that society is now starting to become well aware of, above all, because of the crisis triggered by Coronavirus.

Time distribution of the topics of conversation on sustainability in construction in the media

<table>
<thead>
<tr>
<th>Year</th>
<th>Town planning</th>
<th>Politics</th>
<th>Energy efficiency</th>
<th>Circular economy</th>
<th>Renov and institutional aid</th>
<th>Renovation works</th>
<th>Heritage and infrastructure renov.</th>
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<td>2016</td>
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Period: 2015-2021 Source: Twitter
Taking shape in May 2020, the presentations of both the European Recovery Plan with the Next GenerationEU Funds promote economic recovery though more sustainable practices, such as the Draft Bill on Climate Change and Energy Transition, submitted to the Courts on 19 May 2020.

Thanks to these milestones, the conversation around sustainable construction was established in earnest and grew significantly. In fact, the analysis carried out using the compilation of messages from Twitter shows how 58% of the conversation on sustainability and construction happened from May 2020.

This figure is thought-provoking as in less than a year and a half the conversation grew by 45% on the total recorded between January 2015 until the same month of 2020, demonstrating that although progress had been made towards living more sustainably for some years, the real change of paradigm in terms of the interest generated was because of the Coronavirus crisis. Even so, we must underscore the fact that we’re talking about a very small segment in the conversation on Twitter. For example, in the month of July 2021, sustainability generated 7,786 tweets, and only 4% of them made a reference to the building sector.
It seems even smaller if we consider that, according to Twitter, around 500 million tweets are published every day throughout the world.

The case of the media is slightly different since interest in this topic peaks in the initial months of 2019 and, from then on, the publication of news and reports on the topic increases by more than 700% compared to the previous year. Taking place in December 2019, COP25 led to a major boost. However, due to the news coverage of the Coronavirus crisis, the publication of type of topic was put on pause when the first state of alarm and the confinement of the Spanish population was announced. With the return to our “new normality”, the media started to publish content on this topic once again.

Even so, it’s worth highlighting the specific case of the trade press which, since mid-2016, has been addressing these issues, though around the third quarter of 2019, these types of publications duplicated. Thus, 74% of all the impacts compiled were published between the last months of 2019 and 2021. In addition, not only does the pace of publication on sustainable building increase but the topics addressed also changed since the topics with most presence were those relating to legislation, state aid and renovation of housing until 2019. While from 2019, in line with the trends seen on social networks and other media, the segment that has generated greatest interest is climate change, followed by the events, which grew significantly since the pandemic.
Renovation as a step towards sustainable building

The increase in the curve belonging to the conversation about renovation on social media is particularly important, as it is going from being the least discussed topic of those analysed over more than 5 years to suddenly becoming the main topic of conversation. This has been boosted by increased investment in this area, thanks, above all, to the EU Next Generation Fund and all the support provided in the form of aid from Government and autonomous communities to encourage cities to go green.

In the specific case of the media, for example, the most discussed topics following the Coronavirus crisis are energy efficiency and matters more related to environmentalism and the circular economy while renovation remains slightly behind compared to previous periods, and more so, given its considerable online boom. Even so, it needs to start being genuinely linked with renovation not just to promote improved energy efficiency, but rather as a way to curb the climate crisis.

COP21 and 23 and the Paris Agreement are some of the pre-pandemic milestones that have set the agenda for sustainability in building and have directly affected the segments of conversation that discuss the development of the urban agenda and climate change-related matters.

Time distribution of the renovation topics in the conversation on sustainability in construction

Period 2015-2021 Source: Twitter
As can be seen in this graph, both segments of the conversation have their first significant peak during the period close to COP21 and the Paris Agreement. From November 2017, coinciding with COP23, the bulk of publications compiled increases exponentially, growth that has increased until the present day.

Furthermore, we believe that the segment related to climate change may have been affected by other types of milestones, not directly related to transnational events and agreements between nations, such as Fridays for the Future, the student movement founded in the summer of 2018, but in the spring of 2019 it leapt into the international limelight and became a global movement.

Thus, if at the start of this analysis, in January 2015, this topic made up only 1% of the conversation, it is currently the fourth most-talked-about topic, only behind those related to housing renovation.

**Time distribution of the urban agenda and climate change topics in the conversation around sustainability in building (2015-2021 period)**
Sustainability and housing are not trending topics for politicians

Participation on social media and in the media reflects the importance our society places on the conversation on sustainability in the building sector, but what about our politicians? Although politicians are quite active on social media and discuss a range of subjects, the reality is that houses and the housing stock is not their main concern. In fact, sustainability only makes up 0.44% of the conversations politics have on social media, a very low figure if we take into account the current difficulty accessing housing in Spain.

Furthermore, less than 20% of their conversation on housing is linked to sustainability, quite a low percentage.

In addition, there are only a few people who steer the conversation towards the topic and influence the rest, given that only 29% of the mentions compiled are original tweets, while 71% of the mentions are content that has been shared in the form of a retweet on the social network Twitter.
There’s still some way to go

The main conclusion drawn from the chapter is that although sustainability is gradually gaining an increasing presence in public conversation, the role of sustainable building in that conversation is still not relevant. This remains a very sectoral debate that does not even have a significant presence in trade press, so it is obvious that it is yet to be brought to society.

Thus, institutions and political figures are key when it comes to generating conversation and changes in the current paradigm. The major peaks in the conversation and the initiation of new discussions depend on them. In addition, the communication strategy needs to be reconsidered since, in the current model, there is no space for the debate on sustainable housing, as it is overshadowed by other issues.

In fact, it is very relevant that nowadays true sustainability is not taken into account and the good health of the planet largely depends on buildings that are respectful and sustainable in the long term. On the other hand, when it comes to the general public and the institutions in particular, it seems that the quest for sustainability is being promoted through renovation, yet not with renovation as the ultimate goal, but rather as a means to enjoy better energy efficiency.

Thus, first and foremost, there is a great need to stop thinking of housing renovation solely and exclusively as a means of saving energy and to encourage the concept of sustainability in the sense of respect for the environment, adapting not only transportation in our cities and changing uses and habits in the home but adapting them because we want to foster a healthier and more environmentally-friendly lifestyle among the population, too.
Appendix

Methodology followed for the analysis conducted in the chapter “Communication”

The chapter ‘Communication’ has been written based on an analysis of the different information from Twitter. The data extraction tool Tractor and the data analysis tool Graphext were used to do so. Furthermore, all the activity on Twitter about sustainability and building from a list that includes 820 types of national, regional or trade media was extracted using these same tools.

1 - Sustainability - general area

- Analysis of tweets that contained the term sustainability shared by the main popular Spanish press from July 2020 to July 2021. Tweets analysed: 10,016.

2 - Sustainable building

- Analysis of tweets that contained any combination of the following keywords from January 2015 to September 2021. Tweets analysed: 53,086.

- Analysis of the tweets published by the trade press in the property and sustainability sectors with presence on Twitter 69 types of media that contain any of the combinations of the following keywords from January 2015 to September 2021. Tweets analysed: 12,198

- Analysis of tweets published by the national and regional media that contained any combination of the following keywords from January 2015 to September 2021. Tweets analysed: 21,395

3 - Impact on political settings

- Analysis of tweets that contained the term sustainability shared by the members of the Congress of Deputies of Spain since the start of the term (September 2019 to September 2021). Tweets analysed: 4,729
Building and addressing the challenge of decarbonisation

One of the European Union’s most consistent policies over the last twenty years has been taking a clear position on global leadership when it comes to tackling the problem of global warming, the root cause of which – for some time now beyond reasonable doubt – is known to be anthropogenic in origin. There are three reasons why the EU backs this strategy. On one hand, it seeks to get humanity, using all possible technological and financial means, to face up to the threats that are detrimental to us based on a certain level of warming, albeit in a very asymmetrical way. It is worth noting that Spain is one of the most negatively affected countries within the EU.

On the other hand, substituting fossil fuels with renewable energy would deliver the EU a saving of 320 billion euros annually, in addition to a considerable increase in economic independence as most of the latter would be produced within the EU’s territory.

And lastly, given that, current scientific knowledge indicates that the damage to the world’s globally sedentary and territory-bound population caused by a certain increase in the atmospheric temperature, would be extremely negative, the EU seeks to take the lead in developing technologies that would make it possible to tackle the problem, thereby helping it to regain its position in global leadership, along with the United States and China.

In this strategy, building plays a central role, given that emissions from buildings in the use phase in the EU represent 36% of the emissions derived from energy – 25% in Spain and 28% globally – to which we must add building life cycle emissions, produced in the manufacture of materials, transport to site, construction, renovation, demolition and recycling.
In any case, something to bear in mind in any decarbonisation strategy is that, although it is undoubtedly the driving force that will force renovation of the housing stock, such renovation should not be solely energy-related, especially in the case of housing, which represents around 85% of Spain’s built-up area. Some of the more relevant matters for total decarbonisation in Spain are, firstly, a unitary understanding of the building, which would require a single administrative authority (there are currently two ministries with building responsibilities: the Spanish Ministry of Transport, Mobility and Urban Agenda (MITMA) and the Spanish Ministry for the Ecological Transition and the Demographic Challenge (MITERD)), a single building code that covers both the building envelope and the installations, and for it to be reviewed as a unit.

Secondly, the need to inspect both the design as well as the build itself to prevent the outcomes from being very different to those planned and justified in the design phase. Both the execution and performance should be documented, allowing firm steps to be taken in the right direction.

Thirdly, some regulatory and legislative amendments need to be made. These include the incorporation of an analysis of emissions in the life cycle of the building, compelling buildings to achieve a certain energy rating over time depending on their use, and the development of financial instruments that help to channel private investment into renovation of buildings.

Lastly, one thing is essential if we want to decarbonise the sector: a profound change in the way the different stakeholders in the sector work, which needs to shift from working with a stovepipe approach to working in a much more collaborative and interactive way.
Training
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Context

Training as a lever for sustainability in the building industry

The integration of sustainability into the sector will depend largely on the labour market’s ability to embrace specialised knowledge.

Training has traditionally played a key role in the sector, but the boost from the regulator has placed the spotlight firmly on this issue in the socioeconomic system transition. Sustainability transforms the roles of each stakeholder in the sector’s value chain, supporting collaboration among them and incorporating new specific skills.

The ambition for Europe to become the first climate neutral continent and the integration of social environmental criteria now highlight the important of sustainability in the sector. This change in paradigm means a need to incorporate new knowledge into the labour market.

Thus, the successful integration of sustainability into the sector will largely depend on the labour market’s ability to embrace the specialised knowledge that the sustainable transition requires.

Employees by level of training and year

Training in the sector along the value chain

When looking at training along the value chain it is important to consider the reality of the sector and all its complexities. In the sector, the large majority of professionals only have basic training, representing more than half of employed persons with a level of education equal to or lower than the first stage of secondary school (Compulsory Secondary Education (ESO) and Vocation Training (FP1)). While it’s true that the number of employed persons with a primary school level of education or lower has drastically declined in recent years and higher education has grown slightly, it is still not adequate enough to meet the sector’s requirements.

This trend brings to light the polarity of the profiles in the sector, in which workers are grouped into low and high levels of training and the middle link (Higher Level Vocational Training (FP2)) is stagnating.

This information contrasts with the average for the Agriculture, Industry and Services sectors, where the highest percentage of employed persons corresponds to those who have completed higher education. Thus, despite the increase in this type of profiles within the construction industry, this figure is very far off the 46% average for the rest of the abovementioned sectors.

Employees by level of training (%) and sector

Source: Labour Force Survey, Construction Outcomes and quarter 2020 (Construction Sector Observatory)
Training in sustainability

Sustainability and education

As a subject, sustainability was introduced in 1992 as part of environmental education both in compulsory schooling after the Spanish General Law of the Education System (LOGSE) came into effect, and directly in higher education through the undergraduate degrees at different universities. In this case they were probably influenced by the World Environment Conference held that same year in Rio de Janeiro. However, in the case of vocational training (FP) it is not until the year 2000 that sustainability emerges for the first time, with the creation of the Environmental Awareness Module (MSA).

In its early phase, sustainability was introduced in universities mainly through undergraduate degrees in environmental science. Due to the development of international projects, conferences and research institutes on environmental issues, educational actions have been gradually developed to create new specialised degrees and subjects that fundamentally focus on sustainable development. And despite this, training in sustainability at such an educational level is not common and is not integrated in a cross-disciplinary way throughout educational programmes.
How is sustainability addressed in the sector today?

The data on training in sustainability applied to the sector is very scarce and it is hard to find standardised sources that can shed any light on it. For this reason, the GBCe launched a consultation with our partners, which was used to put figures to thoughts and illustrate the current need to strengthen this lever for a sustainable transformation of the sector.

The results show that those surveyed who have a university level education did not have access to training in sustainability during their ordinary undergraduate degree course. In fact, 80% of the profiles had to seek out extra training to learn about sustainability in their professional lives through complementary courses, Master’s and Postgraduate degrees.

This data is in part evidence that in tertiary education training in sustainability is found at the highest levels (Master’s and Postgraduate degrees) and in complementary training courses, above all in those related to the environment and the urban space, while its representation in undergraduate degrees is much lower, normally in optional subjects.

In the case of Vocational Training, a slight growth in the demand for training in sustainability has been seen, one that is fundamentally aligned with the new regulations that affect, in particular, the construction process (waste management, energy consumption, air quality) and the emergence of new software onto the market.
In the area of complementary specialised training, only topics related to energy efficiency stand out and gain in weight. It is one of the few areas that is perceived to be in demand in today’s labour market, and therefore in which a wide and diverse range of training has been developed. According to the Spanish Construction Labour Foundation:

- Over the past three years (between 2019 and 2021), the Spanish Construction Labour Foundation’s professional training courses on energy efficiency have seen a 359% growth in the number of students.

- The fact that these kinds of trainings are being reinstated is worth highlighting, after the outbreak of the pandemic, which led to very low training numbers (a total of 26 students in all of Spain took this type of course).

- The courses with the highest number of students in 2021 are the most basic ones, related energy efficiency for middle managers and operators.

However, there is not enough data on all the trainings provided in the sector, which are still distributed across the different educational institutions and very dependent on the changes in demand. This demand is in turn conditioned by the interest of owners and managers, who are still not very aware of the importance of sustainability, and are focussed on aesthetic issues or merely economic efficiency measures – only 16% of buyers are interested in the energy efficiency of their future home.

**Survey on training for partners**

Source: Drafted by the authors, Green Building Council España (2021)
Training needs for transforming the industry

Cross-disciplinary competences and new skills

To transform the sector, sustainability needs to be included at all levels and by all stakeholders, from the first to the last, at least on a general basis. Everyone, from the bottom up, must know about and understand the relationship between sustainability and building. The idea is that site workers and building technicians have competences, to a greater or less extent, in areas like the circular economy, the rational use of water and energy or environmental protection on which construction is based, given that the role of each and every professional plays a fundamental role in the overall result.

Thus, training in sustainability should be designed to suit all profiles in the value chain, with special emphasis on trades that are normally less aware of its relevance, as stated in the Study for the Detection of Training Needs in Building and Civil Works conducted by the CRN in 2020 on the following topics:

- Introduction to the concept of sustainability and its importance
- Implications of natural resource consumption
- Sustainable Development Goals
- Smart Buildings
- Sustainable Construction Systems
- Renewable Energies
- Measuring impact and assessment
- Energy simulation
- Quality control
- Life-cycle energy analysis
- Innovative sustainable materials

As can be seen, the new competences to be developed in sustainability are cross-disciplinary and complement other trends such as industrialisation – which would lead to upgraded processes and improved use of resources (for example, LEAN) – or digitalisation – which would integrate data into decision making throughout the whole value chain, as the BIM methodology exemplifies.
The future of the sector

Labour market needs

The arrival of European Next Generation funds will bring with it a growth in employment. The construction sector reached the highest data in terms of the rate of employment in the month of June 2020, with more than 1.3 million employed persons, and saw record figures in terms of social security. Nevertheless, it is still far off the 2.5 million employees before the crisis.

Jobs related to this sector make up more than 5% of the national economy, and more than 4% of the total jobs on offer. However, there is also a profound problem when it comes to the lack of generational takeovers, which is why the Spanish National Confederation of the Construction Industry warned of the lack of fully-trained professionals to cover the jobs needed to implement the Next Generation funds provided by the European Union.

The sector faces another difficulty: employment volatility, which translates into a temporary employment rate above the Spanish average, particularly among young people and foreigners.

There is a higher proportion of employees with temporary contracts in the construction sector (34.6%, one third of those employed) than in other sectors such as agriculture, industry and services (22.4%).

Such employment volatility has strong links to economic cycles, as demonstrated in 2008 after the property bubble burst and its resulting financial crisis or after the state of alarm was declared in 2020.

Despite its obvious complexity, the sector is changing and this can be seen in the emergence of new needs and accompanying demands. Implementing innovations inevitably has an impact on the professionalisation of the sector, which requires profiles that are increasingly suited to future demand.

Current training is not covering the needs and overhauling the sector is an extremely complex task. In its Strategic Agenda for 2021-2023, the Spanish Construction Technology Platform highlighted technical specialisation as one of the challenges in terms of training people employed in the sector.
Most sought-after profiles and new competences

The future development of the building sector is focused on three major areas for transformation or microtrends: digitalisation, sustainability and industrialisation.

These trends are, to a large extent, framed by the arrival of the Next Generation EU funds and will demonstrate the companies’ ability to survive and the interest shown by investors, who consider sustainability to be a highly profitable attribute.

One way to make this process possible is for companies to steer their strategic roadmaps towards training workers in line with these three areas, preferably in a joint and related way. One of the most sought-after will be those relating to renewable energies.

More specifically, profiles specialising in solar energy and photovoltaics from consultants to directors and quality managers, as well as those related to hydraulic energy are expected to see growing demand.

There will be an increase in demand for profiles relating to sustainability in resource optimisation, the circular economy and product life-cycle management. Profiles specialising in sustainable development will be increasingly sought-after, from energy simulation and auditing to carbon footprint calculation associated with parts of a project.

When it comes to industrialisation, prefabrication and process improvement in terms of efficiency and sustainability, demand for these profiles, which are also rare in Spain compared to other countries, is expected to increase. Methodologies such as BIM and LEAN provide the momentum that will bring about an increase in the need for specialised profiles.

In relation to the jobs in technology that will emerge in a few years’ time, the forecast is leaning towards budding professional profiles combining technology and other disciplines. An increase in the demand is expected for professionals with specific training in data development and management technologies and process automation with a background in the sector.

Profiles with basic cross-disciplinary training in the links of the value chain related to the works execution phases will be very relevant. Occasionally these will be non-university job profiles for which training will have to be tailored to suit.
Innovation in training

Professionals in the sector are calling for innovation in sustainability training. They state that certain changes are needed in the training they have received, such as a more experience-based approach that more closely mirrors the professional setting, with “more practical” exercises and where more “tech and digital tools applied to sustainable building” are used.

Due to their direct applicability to the job, training in tools applied to sustainability is one of the most sought-after. In addition, it is a type of education that can be integrated into more innovative training systems.

Despite that, training in these kinds of tools is scarce and poorly coordinated. Because of its reach over recent years, BIM training may be an example to bear in mind despite the fact that it is mainly specialists who request it.

Some of the proposals concerning the incorporation of new skills into the sector include innovation in training models. These innovative initiatives include developing the range of online training through MOOC (free Massive Open Online Courses), e-learning or new methodologies such as learning by doing, an educational theory based on a practical learning approach. Dual Vocational Training, a system in which the student combines apprenticeships in a company and vocational education at a vocational school, is another new model far removed from traditional learning processes, putting the focus on practice as opposed to theory. New technologies, tools and platforms will help to develop increasingly flexible, personalised curricula, which will be a key element in the imminent transformation of the sector.
Measuring Sustainability
Measuring for understanding

Lack of data!

Digitalisation at the service of the life cycle

From building scale to urban scale

Measuring building performance

Why do we measure?

How do we measure?

The European Measurement Framework

Sustainability certification in Spain

A summary of certifications in Spain and their evolution

VERDE

DGNB

Relationship between LEVEL(s) and the Taxonomy

Benefits of certification
**Measuring for understanding**

In order to be able to make decisions and make a case for them, we need objective data, or data that is as objective as possible. Finding out if a building is more sustainable than a standard building requires a framework of rules that defines how we measure that improvement.

GBCe’s main objective is to transform the market, shifting it towards a more sustainable model. This affects both the regulatory world, the most public field of regulation for our sector, and the private investment sector, where the features of the products offered are defined.

On one hand, we have to be capable of measuring sustainability in the building sector, and on the other, we have to measure how the strength of each lever’s participation in the creation of demand. These two fields of measurement are different, but they are both important.

We measure sustainability in our sector using our VERDE and DGNB tools, which clearly define the how and why. The strength of the levers is more difficult to measure. This Country Report is the first step. The next step to follow on from this “version 0” is to create a shared, open, digital platform to compile data on stakeholders and actions to take for collective measurement.

We will indeed create the shared, open, digital platform.
To interact with our housing stock, we need to find out about it, know how many buildings there are and their morphology, how they work, what service they provide, how they are occupied and used. Spain has very few databases that allow us to do an in-depth analysis of the status of our housing stock and its evolution.

A record of all property, the Land Registry is a georeferenced compilation of every property’s surface, use and year of construction. It directly links each building to its owner and is continually updated. This, along with the possibilities for using its data on a massive scale, makes it one of the main sources of knowledge.

The Census, which is updated every 10 years, gives us more information on the evolution of the population and how it occupies buildings. However, in 2011 it became a statistical database, which led to a loss of data quality. In addition, it stopped measuring aspects that were extremely useful for the topic in question, such as the type of heating used in homes, thus a valuable historical sequence was lost.

The architects’ associations collect with each new project a survey of the quality of buildings, which was designed more than 50 years ago and therefore does not meet today’s data requirements.

In recent years we have also had other studies that show partial aspects of buildings. This is the case of the Spahousec study, which provides statistically based information on how energy is consumed in them, or the IDAE’s register of energy certifications.

However, these are only partial studies, which cannot always be linked together to provide a more complete picture. This lack of solid and updated data affects the development and monitoring of strategies and policies that have been proposed in recent years for the transformation of our built environment, such as the ERESEE or the Energy Poverty Strategy, among others.

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This does not just happen at national level, each autonomous community or municipality that wishes to implement a serious policy for monitoring the evolution of buildings comes across the same obstacle to accessing and sharing data, not only theoretical or estimated but real and up-to-date data that is open and transparent to citizens.

The decarbonisation challenge requires us to go deeper, covering the whole life cycle of buildings, not just their use. This is where the lack of data is more blatant, and prevents us from even having an of how far we can go with decarbonisation terms of carbon footprint.

As the Building Life initiative has found, there are currently very few professionals conducting carbon footprint studies, and even fewer conducting full life cycle analyses, and those that do it use different databases and calculation methodologies that make comparison difficult in order to obtain generalisable data.

Some instruments that should be set up in the coming years, such as the Digital Building Passport or Book, are called to play an important role in the work of measuring the bulk of the buildings in Spain, particularly if they can be integrated with other more consolidated databases such as the Land Registry or other existing instruments such as the ITE or the IEE and the energy performance certificate itself. Another hugely helpful step would be to have a database on the environmental impacts of construction products and systems that would make it easier to conduct a generalised and comparable life-cycle assessment.
Digitalisation at the service of the life cycle

At present, digital technology helps us to gain an increasingly greater and more comprehensive insight into the impacts that actually occur in building and the effects associated with them. In addition to developing life-cycle assessment tools, there is technology that helps to obtain the data necessary for the analysis, ensures that it is as accurate as possible, and that the results obtained play a fundamental role in design decision-making.

BIM (building information modeling) technology contributes to the integration and analysis of information about construction components and systems, their behaviour and that of the building as a whole.

There are technologies that can drive the generation and extraction of real and relevant data, such as home automation, the internet of things (IoT) or some of the technology used in smart cities. There are others that help to study patterns and information on different scales, such as the geographic information system (GIS), artificial intelligence or big data technology. Plus, there are those that provide new ways of sharing and verifying information, like blockchain technology.

If digital technology is used properly, it should lead us to measure and assess the impacts more effectively in order to act accordingly.
From building scale to urban scale

The national and international certification systems have given us instruments to measure the scale of buildings. But the debate on our sustainable built environment has been expanding. It is no longer enough to think about the building alone. We need to know the urban scales in order to be able to influence buildings.

Adaptation to climate change, health and comfort, water management and the circular economy are asking us to broaden our perspectives. If we are very limited in terms of the data available about buildings, then at district, city and territorial scale there is even less data available.

Available natural resources, such as water or clean energy, or air quality for ventilating buildings, needs to be optimised on an urban scale. In addition, thermal stress relief with nature-based solutions (green areas, SuDS, etc.) and fostering biodiversity are challenges that can only be addressed in the field of public space.

Some cities already have an advanced digital twin on which we can test and monitor the evolution of the environment. But there’s still a long way to go before this cognitive model becomes widespread and to transform the data obtained into information that can be passed on to citizens to communicate and raise awareness.
Measuring building performance

Europe’s insistence on introducing the building life cycle into regulations is confirmation of the vision that GBCe has defended since its inception with the VERDE methodology, in its reports, in the development of its projects and in its account of the sector in Spain.

The challenge for the coming years is to measure performance of buildings in the use phase and check it against the theoretical measurements in the design phase. These comparisons are very important in order to adjust and improve regulation and design instruments. And just like measurements in the design and construction phase where there is an objective third party verification process, we need to introduce this verification into the use phase too, to ensure the data is true.
Why do we measure?

We all have a more or less intuitive idea of how important it is to measure if we want to understand any type of phenomenon. This understanding generates the knowledge that enables us to transform our surroundings. Once we understand how a phenomenon works, we can modify it or use it for our own purposes. Provided, of course, that adequate means are available.

We know a lot about how buildings work. We know how their structure works. Therefore, we can build with the certainty that the building will not collapse and, once we have mastered this need for safety, we can fine tune the calculations to minimise the structure requirements by using less material, in a more efficient and economical way. Structural calculations also give us freedom of design, more flexible buildings with shapes that would not be possible without this knowledge, that way of measuring, calculating and quantifying.

The same goes for sustainability. We started out with inklings that have gradually been confirmed and consolidated through practice.

Beginning to put numbers to these inklings and calculation methods is what has helped us to understand the different aspects of sustainability, its importance in the global computation, the scope and, of course, it helps us to choose the most efficient solutions allowing us to hit the sustainability targets we set in each case.

Advantages of measuring sustainability:

- Discovering and understanding how the building and housing stock work in general.
- Defining sustainability goals
- Understanding the building’s full life cycle, to
  - make future projects and include the “upstream” impacts.
  - reduce any risks the building may face
- Facilitating quality control through assistance to prepare tender documents and bids
- Reporting the results in an orderly and useful way, so they can be communicated
- Checking the differences or similarities between the project forecasts and the actual running of the building.

Image: Single-family home
How do we measure?

For the advantages indicated above to be real, measurement needs to meet certain criteria:

- Frame the calculation methodologies in an (international) standard to make them comparable. The Spanish Association for Standardisation (UNE) has a family of standards intended to define the framework for assessing sustainability in buildings. Tools like VERDE and DGNB are aligned with these standards framework.
- Ensure transparency with public and verifiable evaluation criteria. Anyone should be able to understand what the issued assessment means. The VERDE 5 Leaves Certificate is awarded to a building with high energy efficiency, low water consumption, a responsible choice of construction materials, a healthy indoor environment that makes people feel comfortable and a construction quality control system, among other things.
- Guarantee independence and objectivity so that a body external to the project (certifying body) conducts an exhaustive review of the assessment to ensure its veracity and quality.

From a technical point of view there are three pillars that should underpin our measurement work:

- The life cycle and circular economy perspective. Understanding that the building starts when raw materials are extracted and ends when it is demolished or dismantled.
- Health and comfort. Buildings are constructed to house personal activities, their ultimate aim is to generate suitable conditions for such activities to take place, whether it is working, studying, sleeping or any other activity we carry out indoors.
- Management and monitoring. All the effort we have put into the project can be sustained during our use of the building because of its management. Monitoring enables us to constantly check the building’s pulse and to correct the way it is being used.
The European Measurement Framework

The LEVEL(s) Framework

LEVEL(s) is a common framework for sustainable buildings in Europe. In response to the Paris Agreement’s demand that the building and construction sector be decarbonised by 2050, LEVEL(s) advocates for a compulsory assessment during the full life cycle: design, construction, use and end of life.

LEVEL(s) is an assessment and information framework that provides a common language for the sustainability performance of buildings.

LEVEL(s) promotes the life-cycle perspective for buildings and offers a sound proposal for measuring and supporting improvements in residential buildings from design stage to end of life.

LEVEL(s) is based on six macro objectives. These can be tracked across sixteen indicators.

The LEVEL(s) common framework is based on six macro objectives that address the key aspects throughout the life cycle of the building. The indicators for each macro objective describe how the building’s performance can be aligned with the strategic objectives of the EU’s policy in areas such as energy, use of materials and waste, water, indoor air quality and climate resilience. As it has only a small number of indicators, LEVEL(s) helps us:

- By providing a simple introduction to circularity and the life cycle perspective.
- To identify sticking points and test the readiness of buildings so they can become more sustainable.
- To define sustainability objectives in the initial meetings of a project among all the stakeholders involved.
- To guide the efforts of designers and clients for improved compliance with European policies.
- To demonstrate how political initiatives can be aligned with the European framework which has been tried and tested by a large number of construction professionals across the EU.

Level(s) framework indicators

<table>
<thead>
<tr>
<th>1. GHG emissions Throughout the life cycle</th>
<th>Primary and final energy</th>
<th>Global warming potential</th>
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<td>GHG emissions</td>
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<td>Primary and final energy</td>
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<td>2. Resource management Life cycle of materials</td>
<td>Inventory of materials</td>
<td>Waste flow</td>
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<td>Resource management</td>
<td>Inventory of materials</td>
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<td>Life cycle of materials</td>
<td>Inventory of materials</td>
<td>Waste flow</td>
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<td>3. Water consumption Circular management of water resources</td>
<td>Consumption in use phase</td>
<td>Service life</td>
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<td>Circular management of water resources</td>
<td>Consumption in use phase</td>
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<td>4. Indoor environmental quality Healthy and comfortable spaces</td>
<td>Indoor air quality</td>
<td>Thermal comfort</td>
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<td>Indoor air quality</td>
<td>Indoor air quality</td>
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<td>Healthy and comfortable spaces</td>
<td>Indoor air quality</td>
<td>Thermal comfort</td>
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<tr>
<td>5. Climate change Resilience and adaptation</td>
<td>Thermal comfort</td>
<td>Luminous comfort</td>
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<td>Climate change</td>
<td>Thermal comfort</td>
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<td>Resilience and adaptation</td>
<td>Thermal comfort</td>
<td>Luminous comfort</td>
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<tr>
<td>6. Cost and value Optimization in the full life cycle</td>
<td>Cost of the life cycle maintenance</td>
<td>Value creation and risk factors</td>
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<td>Cost of the life cycle maintenance</td>
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The Financial Taxonomy Framework

The taxonomy is a European Commission regulation that establishes the common criteria for classifying and identifying sustainable economic activities. Although the tool was primarily developed for the finance sector and investors, it is relevant and useful for any stakeholder or person involved in an economic activity to be sure to be talking about the same thing and thus provides the market with greater transparency and trust, favours those who integrate sustainability into their activities and allays fears about greenwashing.

It forms part of the “Action Plan On Financing Sustainable Growth” and is the first of the lines of action and one of the most important and pressing steps.

The taxonomy provides a list of economic activities that contribute to each of the six environmental objectives defined and established by the technical screening criteria for each environmental objective.

It is based on three fundamental pillars that are common to all economic activities in order to determine that they are environmentally sustainable:

- It makes a substantial contribution to meeting each environmental objective.
- It does not damage or cause significant harm (DNSH or Do No Significant Harm) to any of these objectives.
- In addition, it fulfills minimum social guarantees by integrating, at least for the time being, essential social aspects, yet is clearly inclined to add more ambitious and comprehensive objectives to its initial postulates.

The six environmental objectives the taxonomy supports, which respond to strategic EU policy objectives, linked to the SDGs and the Paris Agreement, are based on climate neutrality and resilience and efficient use of resources and circularity.

The taxonomy determines how sustainable an economic activity is. By checking the fulfillment of each of the criteria for a substantial contribution or no significant harm, it calculates the percentage of the volume of business, investment or volume of assets associated with environmentally sustainable activities.

Sustainability certification in Spain
A summary of certifications in Spain and their evolution

An analysis of the current sustainability situation in Spain aims to provide a general picture of the demand and implementation of these voluntary systems on the market. The certification systems used are VERDE, DGNB, BREEAM and LEED.

The information used has been obtained from data published on their websites on 18 November 2021.

Evolution of registered and certified buildings
Data acquired from the four systems, taking the year 2010 as the starting point, the year all four systems were implemented in full. Grouping together the records prior to that year in one single piece of data.

To make a comparison and group data homogeneously, the following premises were followed:

- One record was taken into account for each building, using whichever one was the most advanced in the certification process.
- The number of certified buildings was considered - both those that had completed the certification process as well as those that had only received pre-certification in the design phase.
- The schemes that only certify the use phase were not considered.
- Due to the large variety of uses and typologies of buildings analysed, they have been divided into the following groups:
  - Private residential buildings
  - Office buildings and facilities
  - Housing developments and logistics parks
Analysis of buildings registered and certified by use and typology

Data taken from the four systems, by their use and typology considering the groups established in the study, that allows us to see the implementation in the different sectors.

Regardless of the system used, the Spanish market clearly shows ambition that is limited to obtaining average results. This may lead us to conclude that the value of the certificate mainly lies in obtaining a seal to be able to show that sustainability is part of a corporate policy or political pledge. Ambition lies in commitment, not in results or learning. These are the features of a front runners market, a market that is starting the process of certifying sustainability.

Given that there are no further certified buildings with a higher rating, this shows us that sustainability is still an exercise where the totality of concepts is not the most important factor but rather partial exercises with energy efficiency as the common and dominant criterion among all the certified buildings.

With the bulk of certifications at the average rating, whether the lower levels are still required or not is open to debate.

- Perhaps it is not the right time to up the benchmark requirements so that the market aims for more ambitious levels of sustainability.
VERDE

VERDE is an assessment system used to measure the sustainability of buildings developed by Green Building Council España. It assesses the performance of a building as a whole, and provides the reduction of the impacts that buildings achieve when they are designed and built according to its methodology.

It is developed using Spanish regulations and our building method as a basis. It has an integrated life cycle perspective and resource circularity as the key framework for developing the criteria within which the indicators assessed are arranged. It is aligned with European policies, the LEVEL(s) framework and the Taxonomy, including its indicators in the assessment of its criteria. It also incorporates the SDGs, establishing in each criteria the goals and targets to which it contributes.

VERDE measures sustainability through 46 criteria distributed across six areas, covering environmental, social and economic aspects that address sustainability and it incorporates a cross disciplinary area that assesses the building quality.

The criteria include environmental aspects such as protecting biodiversity, material management, water and energy as well as associated emissions.

The social aspects focus on health and comfort, designing spaces that foster social relations, biophilia and the building’s ability to be adapted to different uses. The economic part focuses on the increase in the building’s value once it has obtained a sustainability certification.

Yet it also considers very important aspects like the quality of our buildings, assessing the quality of the building envelope, monitoring execution and checking the building runs properly once it is constructed. All of which is to guarantee that the building has been built as planned.

VERDE assesses the sustainable performance of buildings using indicators defined in each of its criteria and their associated impacts, following the methodologies established by the standards framework UNE 14643, which defines the framework for assessing the sustainability of buildings.

To define the weight of each of the criteria, i.e. its relevance, on one hand, it establishes six characteristics that assess the soundness of the and, on the other, the 15 impacts with the degree of influence the criterion has on them. This results in the VERDE impacts matrix.
The DGNB certification system is the assessment system developed by the German GBC which we at GBCe have adopted to suit the Spanish reality and called DGNB ES System. It is a planning and optimisation tool that allows all the parties involved in the construction to undertake projects based on sustainability in their most holistic sense. It systematically assesses the full life cycle of a construction project and evaluates its overall performance.

It establishes six main themes and goes far beyond the architectural design of buildings and includes, for example, town planning and the integration of art. It places human health and happiness at the core when it comes to making design decisions and during construction of the building. It enables us to evaluate and measure circular economy solutions at building level. It promotes innovative passive solutions. The design and quality of the construction are considered an integral part of sustainable construction. It is aligned with the SDGs and complies with the LEVEL(s) framework and Taxonomy principles.

In line with the concept of sustainable design and its holistic focus, the DGNB ES System is based on the three pillars of sustainability, which place equal importance on economic, ecological and sociocultural factors, giving the same weight to each of these areas. It also assesses three other cross disciplinary areas that cover the technical aspects, design processes and the quality of the construction works, as well as the quality of the building site.

Within these six areas 38 criteria are assessed that consider the environmental conditions, preserving biodiversity, making buildings economically viable, adaptable to various conditions and able adjust geometry to suit needs. To guarantee excellent quality air avoiding harmful substances, to have a well-designed building envelope and carry out the tests that back it up. To guarantee thermal, visual and acoustic comfort, personal autonomy, as well as facilitating communication and relations, and, of course, a building accessible and comprehensible to all. It defines the sustainability goals from day one, considering construction management and the documentation necessary for the facility's management in advance. It prioritises passive means, optimising maintenance and repair. It considers adaptability, deconstruction and recycling.
Reducing the extraction of resources, looking after water management, land degradation, protecting biodiversity and fostering social improvements are other aspects that are taken into account.

The DGNB system is intended for use as a motivational and planning tool, which has proven to facilitate the creation and management of better buildings. Sustainability must be seen as an integral part of each construction project instead of being an additional element or optional consideration.

To achieve this, there are six pillars:

- The people at the heart of the project: health and comfort are key when it comes to designing a building.
- Circular economy: one of DGNB’s main concerns is promoting the responsible use of resources.
- Design quality: attention is paid to the building’s contribution and its outdoor space as part of town planning.
- Sustainable Development Goals: DGNB supports these goals and wishes to promote taking a specific step in the right direction through certification.
- Climate protection: the greatest challenge of our time will be addressing climate change issues and reaching the objectives set out in the Paris Agreement 2015.
- Innovation: sustainability is continually shifting and progressing, and DGNB wants to encourage this dynamism by establishing a flexible and adaptable system to assess the innovations developed in order to reduce the impacts of the building.

**Relationship between LEVEL(s) and the Taxonomy**

Both the VERDE and DGNB systems have the LEVEL(s) and Taxonomy frameworks incorporated into their set of criteria and indicators. For its part, GBCe is committed to completing and adapting its certification systems to the European framework.

Second generation certifications like VERDE or DGNB have life-cycle assessment and impact calculations, like climate change, in their very DNA. We share with the European policy the vision and understanding of analysing the building from its conception to its use phase and its transformations at the end of its useful life.
Benefits of certification

If they are developed and applied responsibly, certifications can play a crucial role in transforming the sector and making it more sustainable.

The basic principle of certification is to verify and classify previously defined requisites, and ideally should be carried out by an impartial third party. This process is used as a guarantee of quality, it generates trust and credibility, and it can lead to information being more transparent.

In addition, certifications may act as a guide for manufacturers, planners and decision makers, enabling self-monitoring and encouraging continuous improvement.

Finally, certifications also provide a way of defining acquisition requirements and, therefore, of comparing the sustainability of products, services and systems.

There is evidence that sustainable buildings gain clear recognition and they can be a marketing tool too. It’s not just about saving the planet.

Certification is forward planning that avoids risks and cost overruns:

- A study conducted by WorldGBC states that the economy also benefits from investments in sustainable buildings as operational costs are reduced by 8% after just one year and 14% after 5 years.
- In addition, an increase of 7% is seen in the value, and a 7-year amortisation of the investment.

Certification schemes are a tool to help define sustainability goals, establish their planning and optimisation, implementing quality processes throughout the design development, the construction process and use of the building. They are useful for any person involved, a property developer, project team, construction company, manager or user.
ESG, beyond the Taxonomy

Following the European Commission's presentation of the Taxonomy framework in 2020 and the Taxonomy market research coordinated by the CPEA (Climate Positive Alliance Europe), both the Commission and the market itself are exploring how to include social and governance aspects in the strategies that assess companies' performance in terms of sustainability.

CPEA (www.cpea.eu) has again consulted with investors and property developers to respond to an imminent request from the European property market: "To harmonise and develop a standard ESG/ASG for the European industry".

The European ESG Work Group has been set up to pool knowledge and experience and to explore how existing ESG instruments and reports can be unified. With fortnightly meetings and internal surveys, the objectives and work plan will be guided in the right direction.

First conclusions:
- The biggest driver for developing an ESG strategy is risk management and the need to be prepared for the near future. To a lesser extent, they indicate market positioning and reputational, social and moral considerations.
- The greatest obstacle to their implementation is the lack of reliable data available.
- The social aspects are the biggest unknown. The environmental and governance aspects are the least problematic.

A partnership with the IHRB (Institute for Human Rights) in the area of social aspects has indicated the initial guidelines on how to solve the difficulty of measuring social aspects. In its report “Financing Human Right-Based Decarbonisation in Europe’s Built Environment” (https://www.ihrb.org/ focus-areas/built-environment/ financing-human-rights-based- decarbonisation), it states some key messages:
- It is possible to introduce social aspects without metrics or data. The most important element is the set of objectives you want to achieve and to define the process in order to achieve them.

- It is important to involve governments, local authorities and investors to increase capacity and experience in social areas throughout the value chain.

- It is key to integrate considerations about social rights from the start of the project.

The difference between the Taxonomy framework, which is geared exclusively towards assets and property portfolios, and the ESGs is the perspective that goes beyond the constructed object. The company’s performance and commitment though its long-term strategy opens the door to being able to measure and verify sustainability in the building’s use phase and the relations with the final users of the properties.

We know that the Commission will take gradual steps in these areas. We have already seen this in the Taxonomy framework, where the more tangible indicators are implemented in the first phase, the more complex indicators will be gradually introduced and the social compromise is a “light” requirement linked to the OECD Guidance for Multinational Enterprises and the UN Guiding Principles on Business and Human Rights.

The CPEA’s work aims to accelerate the introduction of these aspects giving direct input to the Commission based on companies’ real capacity to lead the change in the market. Its achievements are a reality that should serve as a starting point and benchmark for the regulatory world.
The Agenda for the Current Generation
2021 with a European strategy such as the Green Deal, the Next Generation Funds under way, the LEVEL(s) framework consolidated and the Taxonomy in full swing, we can no longer just talk about a vision, about ideas, about high level strategies. It's time to implement schemes, to sit up and take action, to turn recommendations into events.

The transformation of our sector and building and city models needs, on one hand, instruments that stimulate the demand such as the five levers contained in this Country Report, and measuring systems that can monitor and assess the measurements, but on the other hand, it needs to clearly mark out the areas that need to be tackled most urgently.

The UN and the IPCC, the European Green Deal and Spain’s Climate and Environmental Emergency Declaration in 2020 brought the main need to the table: decarbonisation.

The COVID crisis has clearly shown us that the topics of health, comprehensive renovation of the city and its housing stock, and the creation of a resilient society are closely linked.

In 2010 at the COP 10 in Aichi in Japan, the UN had already released the first document to save our biodiversity.

In 2020, the Stockholm Resilience Center confirmed that biodiversity is one of the two planetary boundaries that is now in a high risk situation, even more than the climate change boundary. The development of cities, infrastructures and buildings can take a high level of responsibility for this problem.

And given that the circular economy cannot be self-organised, we can talk about a regenerative economy, closer to the ecosystems where waste is no longer waste but becomes a necessary raw material.
Decarbonisation

Although the loss of biodiversity across the world is in a much worse state than climate change, climate change is advancing at a rapid pace and the consequences of exceeding the limits will have much more impact over the short term for mankind: decarbonising our society is the number one matter of urgency.

Because of both global warming and oil shortages, decarbonisation is the only way to guarantee the future development of a sector as important to the economy as building.

Decarbonisation touches on the whole life cycle: the raw material processing industry, construction, transport, the use of the building and the transformation phase to the end of its useful life: reducing energy demand, increasing renewable energies, databases to measure and verify, etc.

Health

The relation between human health and the built environment is divided into three topics: physical, cognitive and sociorelational.

Our current model is characterised by materials that affect the neurological system, spaces that do not enable healthy relationships with the rest of society, buildings that never rest or work properly, a city where personal physical movement is not so easy, a city where the growth of children is limited, and where there are too many barriers for the elderly.

There are plenty of indicators that can measure health and well-being in buildings and in the urban environment. We have the knowledge, we just need to apply it.

It’s time for a debate on habitability, monitoring the use phase of buildings with health sensors, educating the Next Generation to demand higher standards, etc.

Comprehensive renovation

Our cities need thorough renovation. From legal aspects like property structure to structural transformations of the public space; from tolerance and the social mix to education on the care, cleanliness and diverse use of the city, from adapted mobility to nature-based solutions, from shared resources (water, energy, space, air, etc.) including respect for rest.

Renovating the energy aspects of buildings is no enough.

We need to implement the building passport, our local economy, knowledge on the advantages of ecosystems, and a radical reduction in the use of the car. It’s time to fund integrated steps that affect the public space and private property...
**Biodiversity**

The loss of biodiversity is one of the major threats to our planet. It's a colourless, odourless poison and it is not seen in the same way as other major disasters such as climate change i.e., we don't see it, so apparently it does not affect us.

We think that the loss of a few species is not serious. But each species is necessary for other species to live and survive. And let's not forget that us human beings are just another species, to boot.

It's time to restore nature-based urban networks, for the mass introduction of green roofs, local water management, soften city-country boundaries, to educate about the complexity of ecosystems, and to introduce biodiversity indicators in the ESGs/ASGs, etc.

**Resilient society**

A new model must be shared and held up by the public. If the user, owner, tenant, you and I do not understand why we are making changes, then there won't be a transformation.

For a resilient society, we cannot leave anyone behind. Nature can give us infinite examples of where the whole is so much better than the sum of its parts. A resilient society is identified by its commitment to improving and evolving despite difficulties.

The challenges of climate change, the loss of biodiversity and pandemics such as COVID call for joint actions, decisions agreed on by consensus, and helping those who face most difficulty in overcoming their problems.

It's time to take a good look at the 10 of the 17 SDGs that deal with social aspects (equality, hunger, poverty) and to educate, educate, educate, educate!

**Circular Economy**

Waste is a raw material, no matter what form it takes. The concepts of circularity are applicable across all scales: the materials, the building, the city and the territory.

The circular economy has witnessed many debates in the sector. We already have the first regulatory frameworks. It is now important that the corporate world invests in innovation and business models.

We must at last consider the building as a raw material mine (new and innovative), as if it were a geological atlas. We need a passport for building materials and cities, to commit to lifelong learning throughout our professional lives and seek systems that regenerate value over time.
Next steps to take

These 6 areas of work that we indicate for the next decade will give us the content to use and actions to take. The implementary instruments are the five levers in this GBCe Country Report: training, communication, innovation, regulations and funding.

We cannot conclude this GBCe Country Report 2021 without defining the next steps to take. We believe this report is the basis for defining our long-term work plan, for increasingly ascertaining the actions that need to be taken to transform the market.

Our next step will be to create a shared, transparent and collaborative digital platform with the following objectives:

- To reflect on the **results of measuring sustainability in building** using our VERDE, DGNB and Taxonomy tools.

- To create a **database of stakeholders** who bring value to the transformation.

- To constantly **monitor the actions taken concerning each lever**.

- To publish reports on a regular basis that inform readers about the progress made.
About Green Building Council España

GBCe (Green Building Council España) is the main organisation for sustainable building in Spain.

Founded in 2008, we are the benchmark organisation in the transformation towards a sustainable model for the building sector.

We belong to a wide, growing and diverse global network with organisations in more than 70 countries and 36,000 members that represent the value chain: World Green Building Council, WorldGBC.

Along with our partners we train, certify and provide connections to accelerate the transformation towards a sustainable habitat.

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