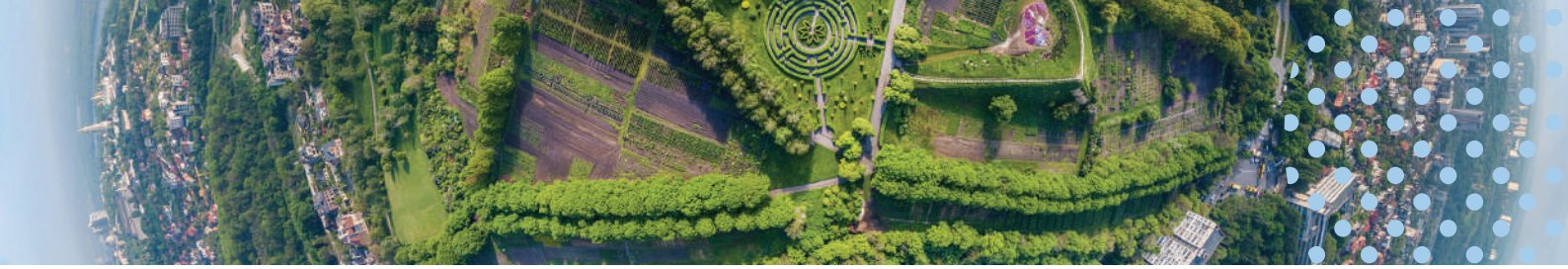
LIFE Level(s)

Layman's Report

# MAINSTREAMING SUSTAINABLE BUILDINGS IN EUROPE

NOTE: This project has received funding from LIFE Program under the Grant Agreement number LIFE 18 GIE/ES/000911 Life for LLL(s).



# Contents



## Project details

## LIFE18 GIE/ES/000911

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|---|---|
| Project title: | **Life for Lca Lcc Level(s)** |
| Short title: | **LIFE Level(s)** |
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| Project website: | https://lifelevels.eu/ |
| Lead beneficiary: | Green Building Council España (GBCe) |
| Coordinator and contact person: | Borja Izaola; borja.izaola@gbce |

# Partners

**Green Building Council España**

C/ Moreto, 15, 6º izda. 28014 Madrid,
web: www.gbce.es; e-mail – info@gbce.es

**Green Building Council Italia**

Piazza Manifattura 1, 38068 Rovereto (TN);
web www.gbcitalia.org; e-mail – info@gbcitalia.org

**German Sustainable Building Council**

Tübinger Straße 43, 70178 Stuttgart;
web – www.dgnb.de; e-mail – info@dgnb.de

**Dutch Green Building Council**

Zuid Hollandlaan 7, 2596 AL Den Haag;
web – www.dgbc.nl; e-mail – info@dgbc.nl

**Croatia Green Building Council**

Ulica Grada Vukovara 274, 10000 Zagreb;
web – www.gbccroatia.org; e-mail – info@gbccroatia.org

**The Irish Green Building Council**

19 Mountjoy Square East, Dublin 1;
web – www.igbc.ie; e-mail – info@igbc.ie

**Green Building Council Finland**

Lapinrinne 3, 00100 Helsinki;
web – www.figbc.fi; e-mail – info@figbc.fi

**Alliance HQE-GBC**

4 avenue du Recteur Poincaré, 75016 Paris
web – www.hqegbc.org

# Introduction

The impact on climate, environment and human health roots in a multitude of human-related actions, with the building sector and construction industry being a significant cause of concern. **European buildings amass around 40% of energy expenditure** and are **responsible for 36% of $CO_2$ emissions**.

When it comes to buildings, health and environmental impact stemming from generated waste, extracted material and carbon emissions, require an approach focused on the ***Whole Life Cycle* of buildings** – making them more sustainable.

EU policies and strategies like the Circular Economy Action Plan, the Green Deal, the Taxonomy Regulation, the New European Bauhaus, and the updates of technical directives as the EPBD, use the **The Level(s) European Framework for Sustainable Buildings** to report on the social, environmental, economic, climate adaptation and human health performance of buildings.

Eight green building councils of the LIFE Level(s) project decided to tackle the need to mainstream sustainable buildings in Europe.

**Green Building Councils are independent, non-profit organisations made up of businesses, organisations and professionals working in the building and construction industry**

The goal of LIFE Level(s) project is to **generate awareness and promote the use of Level(s) Framework by both buildings sector leaders and policymakers**. The LIFE Levels project looks to overcome the barriers caused by challenges such as lack of data and expertise.

Stakeholders from key institutions that are driving policies and creating impact on EU and national level such as European Comission's Directorate General for the Environment and industry beneficial organizations such as ECO Platform, working on sustainability of products and creating data for whole life cycle minded stakeholders, have supported the LIFE Level(s) project throughout its implementation and realization of its ambitious scope.

**Josefina Lindblom,**
**Senior Policy Officer,**
**European Commission**

*Strategic public procurement provides possibilities to boost the economy as well as innovation towards sustainability. By integrating the Level(s) Framework into public procurement, the procurers can ensure that the aspects of the effects that buildings have on the environment are taken into account.*

**Christian Donath,**
**Managing Director,**
**ECO Platform AISBL**

*We see Level(s) as the universal adapter from regulation to technical methodology in the context of sustainable buildings. This is particularly important to have a stable, reliable and affordable methodological basis, while regulatory or voluntary requirements are diverse and need dynamic development. ECO Platform supports this approach from the product data side.*

# The project goals:

- Lay the foundation for the alignment of Europe's leading Building Certification Schemes with Level(s) sustainability indicators
- Advocate for the use of quality product data to form comparable quality metrics
- Create a backdrop for integration of national Green Public Procurement (GPP) criteria with the administrative and data requirements of Level(s)
- Train key target groups; building professionals, product manufacturers, public authorities to use Level(s) indicators

# Why Level(s)

**Level(s)** provides a common language for **assessing and reporting the sustainability performance of buildings**. It offers an extensively tested system for measuring and supporting improvements, from design to end of life.

The framework was designed as an assessment and reporting tool for sustainability criteria of buildings and has been **tested in over 130 projects**. The Level(s) indicators provide significant data on three "levels" or project stages:

**Conceptual Design**

Accessible entry point for the use of each indicator, assessments are qualitative

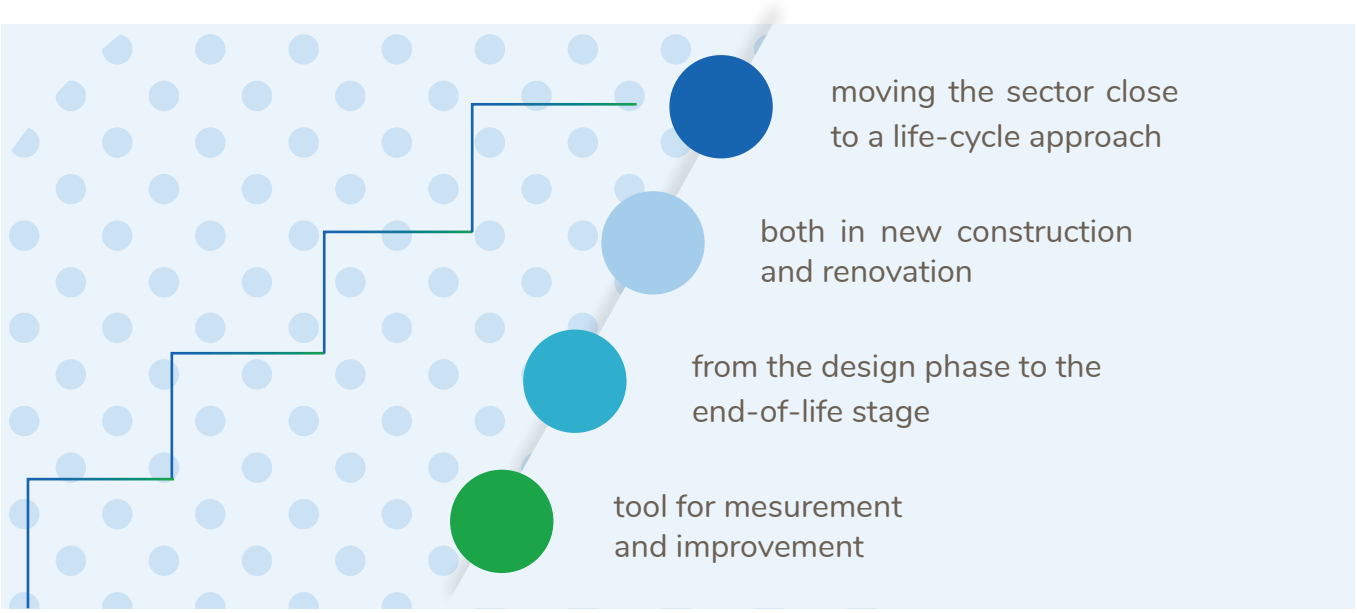
**Detailed Design and Construction**

Quantifying the performance of building designs

**In-use Performance**

Data collection on the real performance of the building project

Level(s) is a holistic tool that aims to move construction value chains closer to the circular economy and to address the *Whole Life Cycle* of buildings in a way understandable to policymakers, building professionals and investors.




By stressing environmental impacts of buildings, future-proofing products, using quantifiable indicators for health and wellbeing, costs and risks, the Level(s) framework lies at the core of delivering sustainability.

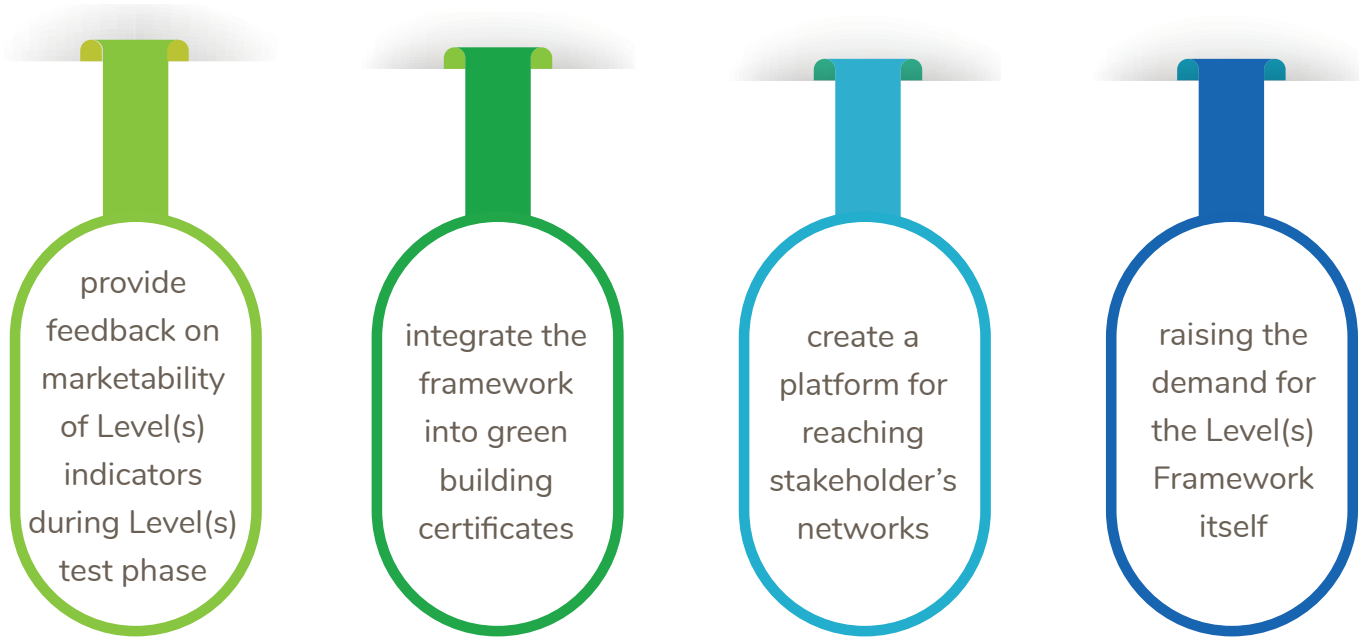
# Aligning green building certification schemes to Level(s) indicators

Key sustainability elements of building performance are outlined in Level(s) macro-objectives. From GHG emissions and resource efficiency, through wellbeing and health, all the way to climate resilience and cost optimization, **each Level(s) macro-objective includes quantifiable and comparable indicators**.

**Table 1.** Level(s) themes, macro objectives and indicators

| | | | | | | |
|---|---|---|---|---|---|---|
| **RESOURCE USE AND ENVIRONMENTAL PERFORMANCE** | | | | | | |
| Macro Objectives | **1. Greenhouse gas emissions throughout building life cycle** | 1.1 Use stage energy performance (kWh/m2/yr) | 1.2 Life cycle Global Warming Potential (CO2 eq./m2/yr) | | | Indicators |
| | **2. Resource efficient and circular material life cycles** | 2.1 Bill of quantities, materials and lifespan | 2.2 Construction and Demolition waste | 2.3 Design for adaptability and renovation | 2.4 Design for deconstruction | |
| | **3. Efficient use of water resources** | 3.1 Use stage water consumption (m3/occupant/yr) | | | | |
| **HEALTH AND COMFORT** | | | | | | |
| Macro Objectives | **4. Healthy and comfortable spaces** | 4.1 Indoor air quality | 4.2 Time out of thermal comfort range | 4.3 Lighting | 4.4 Acoustics | Indicators |
| **COST, VALUE AND RISK** | | | | | | |
| Macro Objectives | **5. Adaption and resilience to climate change** | 5.1 Life cycle tools: scenarios for projected future climatic conditions | 5.2 Increased risk of extreme weather | 5.3 Sustainable drainage | | Indicators |
| | **6. Optimised life cycle cost and value** | 6.1 Life cycle costs (€/m²/yr) | 6.2 Value creation and risk factors | | | |

In order to bring Level(s) into Europe-wide application, the goal was to:




The project established a step-by-step procedure to identify the level on which the selected Level(s) indicators were already aligned with existing green building certification schemes, to explore how their integration can be further advanced and to encourage the stronger uptake of Level(s) in markets operating the certifications schemes. For that reason, a quantitative and qualitative review of the links between the Level(s) indicators and those of the green building certification schemes was performed and the developed tools for the mapping and reporting of the indicators was made available for further stakeholders.

To determine which green building certification schemes to evaluate, the following selection criteria were applied

Linking Europe's main green building rating tools to Level(s):

Selected green building rating schemes – **DGNB (GER), NF Habitat HQE (FR), HQE BD (FR), VERDE (ES), BREEAM-NL(NL), RTS System (FI), HPI (IE), GBC Home (IT), and GBC Condomini (IT)**

**Mapping procedure** - identifies how the Level(s) indicators align and conform to the indicators within the relevant rating schemes

**Conformity assessment** – applying the mapping tool to selected rating schemes

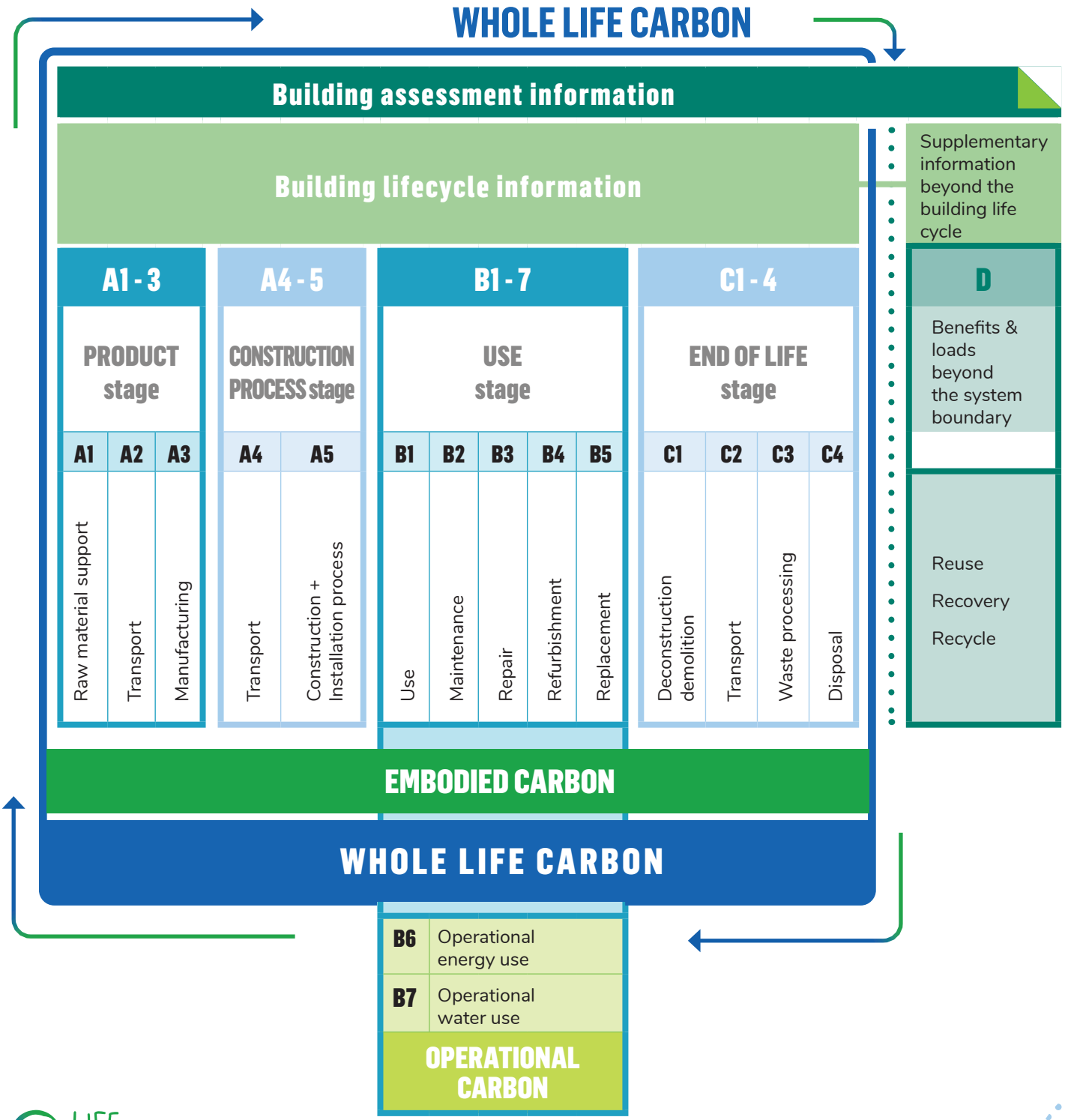
**Reporting template** – easy to use interface to simplify the Level(s) reporting and a tool for certifiers to report on the compliance of the indicators of their schemes to Level(s)

The synergy potential between green building certification schemes and Level(s) cannot be overstated as the Level(s) Framework macro-objectives address sustainability concepts over the *whole life cycle* of buildings in line with EU policies and climate goals, while green building certification schemes provide national specificities and further building sustainability topics.

# Quality data on environmental impacts of building materials

As building standards and codes require better performing buildings in order to lower operational carbon, building designers generally need to increase the material specifications of their designs to meet these standards. This increase in material demand can lead to an increase in the embodied carbon of a design as more manufacturing is required to supply better performing materials.

This means that the carbon savings of improved performance are negated by increased emissions in manufacturing of materials and worse, it brings those emissions forward in time from the operational phase of the building's lifetime to the construction phase.




For embodied impacts of building materials, finding and selecting this data can be more problematic.

The best source of data for the environmental impacts of building materials or components is an **Environmental Product Declaration (EPD)**.

It is typically produced by an LCA consultant using data on raw material quantities, energy inputs and transport methods and distances supplied by the manufacturer.

It is hoped that by demanding to see EPDs from suppliers and manufacturers they will be incentivised to produce them, examine their processes, and seek to improve their carbon footprint.

**An EPD sheds light on the manufacturing processes of specific products and allows specifiers to better understand the environmental impacts of the supply chains they use when designing a building.**

If the design is still at an early concept stage and specific suppliers cannot yet be selected, it is necessary to have generic data to evaluate which approach is likely to lead to the best outcome, and where the hotspots in the design are likely to be.


Generic data can be replaced with the specific EPD data from suppliers to build up a more accurate model of the building's environmental impact and possibly slim down the carbon footprint further.

Level(s) includes an inventory that defines the scope of the analysis through mandatory aspects and includes the condition that it must be the third party verified.

A report on the level of LCA data available on the most common building materials in a number of participating countries was developed, and an effort was made to establish a generic average for each country. This average was then published and national consultation was sought. These "generic average" data allow building designers to estimate the likely embodied carbon of their designs at the earliest stages of a project

Checklist to help verify that the results reported are based on a comprehensive assessment of all the criteria that the Level(s) Framework indicates

National consultations on the availability of LCA data on construction products

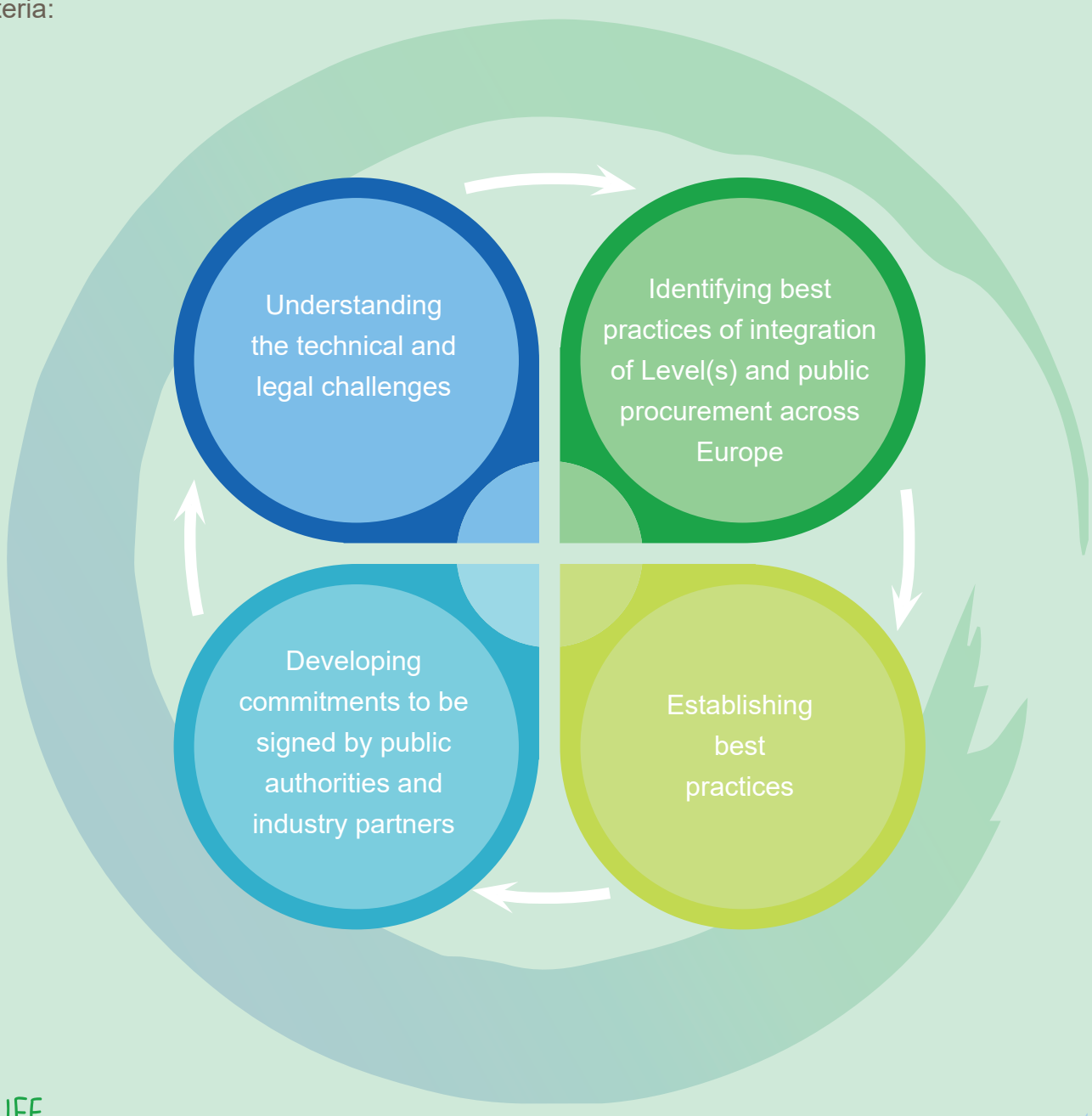
# Level(s) as a part of Green Public Procurement

Under EU procurement policy, tenders that exceed a specific set amount need to abide by a set of minimum requirements set by the EU. This policy has been transposed into national legislation by each member states. Member states have additional legislation for smaller tenders.

One of the European Commission's goals when establishing the criteria within the Level(s) Framework is to **ensure public procurers are able to take into account environmental aspects**.

Level(s) framework supports Green Public Procurement in Europe. The Level(s) Macro-objectives and Indicators can inspire sustainable procurement procedures and define useful criteria.

Steps in guiding public procurers towards aligning Level(s) indicators with public procurement criteria:



# Level(s) capacity building

Level(s) training was carried out by GBC's as a part of their educational programs based on **tailor made training materials on LCA, LCC and IAQ indicators, including EPD's as supportive content**.

Lessons learned from the Level(s) training served as a platform to develop the After-LIFE Plan – recommendations on how to replicate the training experience, report on its effectiveness and suggestions for further improvement, all with a goal of reaching wider audiences and synergies in the future.

Public authorities must strengthen their capacity to integrate Level(s) sustainability indicators into public procurement criteria

+

Building professionals, contractors, manufacturers and consultants need to increase the use of whole life cycle approach and environmental information on products and building projects

Mainstreaming sustainable buildings in Europe requires training different sides of the value chain

# Market impacts

Results of a detailed analysis of alignment of certification schemes with Level(s) indicators:

## Tools

**MAPPING TOOL**

Allowing to assess conformity with Level(s), identify gaps and derive input for further development of certification schemes

**REPORTING TEMPLATE**

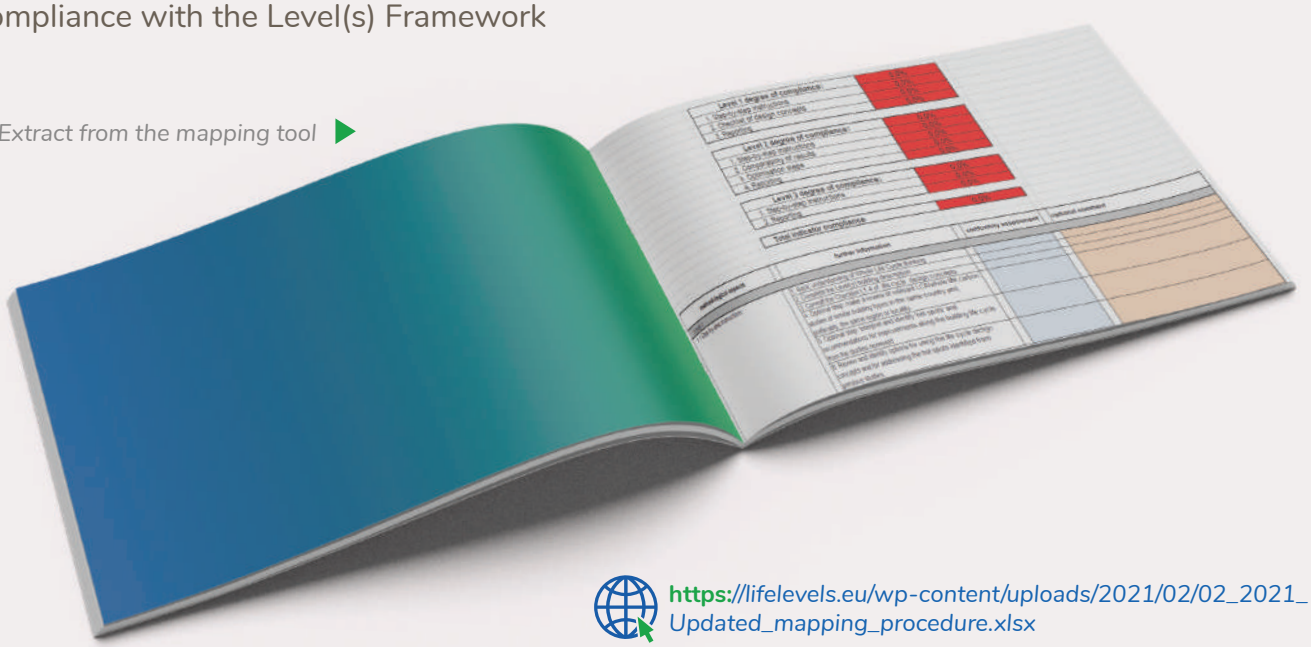
Allowing to report Level(s) indicators in a consistent and structured way and offering possibilities for communication

## Outcomes and Communication

- Recommendations on further development of the Level(s) Framework during testing phase
- Recommendations on (further) integrating Level(s) indicators into certification schemes of project partners
- Europe-wide webinars to share experience and invitation to use tools provided free of charge
  - For Level(s) pilot projects and further building sector stakeholders
  - Green building councils and certification scheme providers

The mapping tool is available for all certification schemes active in Europe, to check their degrees of compliance with the Level(s) Framework

*1. Extract from the mapping tool*



https://lifelevels.eu/wp-content/uploads/2021/02/02_2021_Updated_mapping_procedure.xlsx

An easy to use reporting template for all potential users of Level(s) provides a quick check-in of projects


2. Extract from the reporting template

https://lifelevels.eu/wp-content/uploads/2021/04/14.04.21_Levels_Reporting_Template_DGNB.xlsx

Solutions provided through research on quality environmental data on building materials:

REPORT ON THE AVAILABLE INFORMATION ON POLLUTANTS CURRENTLY CONTAINED IN CONSTRUCTION PRODUCTS

Standardized form for manufacturers to report on pollutants

RECOMMENDATIONS ON THE USE OF DATA AND DEVELOPMENT OF GENERIC DATA FOR COMMON MATERIALS SUCH AS CONCRETE, CEMENT, STEEL, GLASS, AGGREGATES, ALUMINIUM, BRICK AND TIMBER

**Verifier checklist – verification report template assessing the compliance with Level(s) indicators, providing quality control of building level LCA/LCC**

Report for Spain

https://lifelevels.eu/wp-content/uploads/2021/06/Report-B2_Ecometro-1.pdf

Report for Ireland, Italy and Croatia

https://lifelevels.eu/wp-content/uploads/2021/06/LIFE-Levels-CAR-Report_revB_10May-2021.pdf


*3. Report for Spain*

*4. Report for Ireland, Italy, Croatia*

Steps to incorporate Level(s) indicators in public procurement criteria Europe-wide:

Europe-wide **consultations on public procurement standards**

**National workshops** on best practices in public procurement

**Best Practice Guide on Level(s) indicators in public procurement**

**Commitments of public authorities and companies** to use Level(s) LCA, LCC and IAQ indicators into GPP

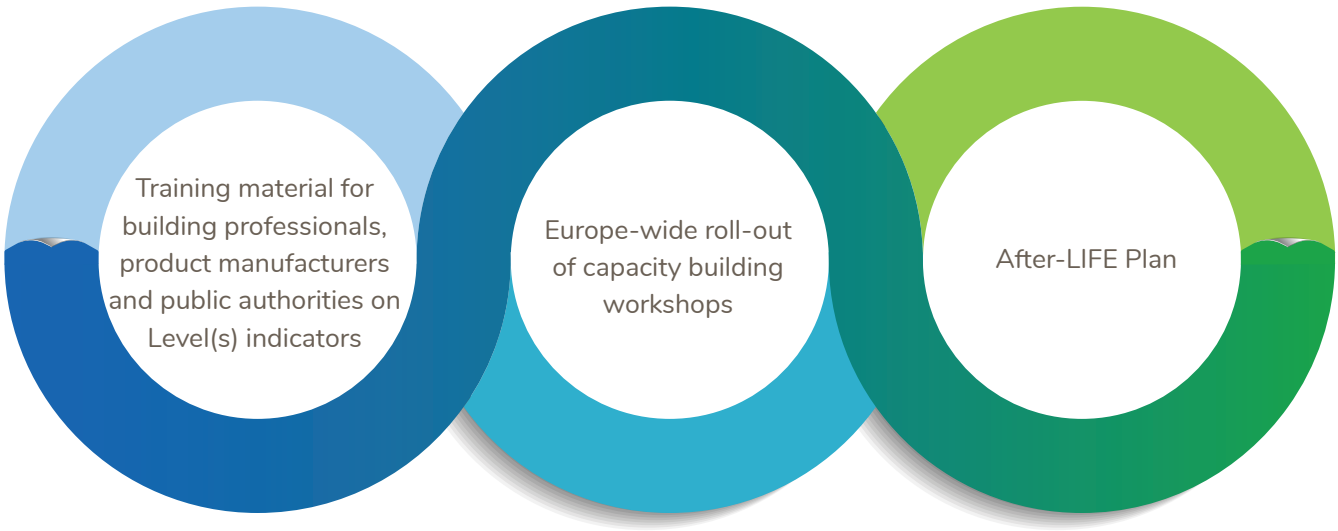

▲ *5. Best Practice Guide on Level(s) indicators in public procurement*

More than 80 commitments to implement Level(s) indicators into the building sector were signed by public authorities (municipalities, agencies, regional governments) and industry representatives (civil engineers, architects, consultants, product manufacturers, developers) from 8 countries.


▲ *6. Industry stakeholder commitment example*


▲ *7. Industry stakeholder commitment example*

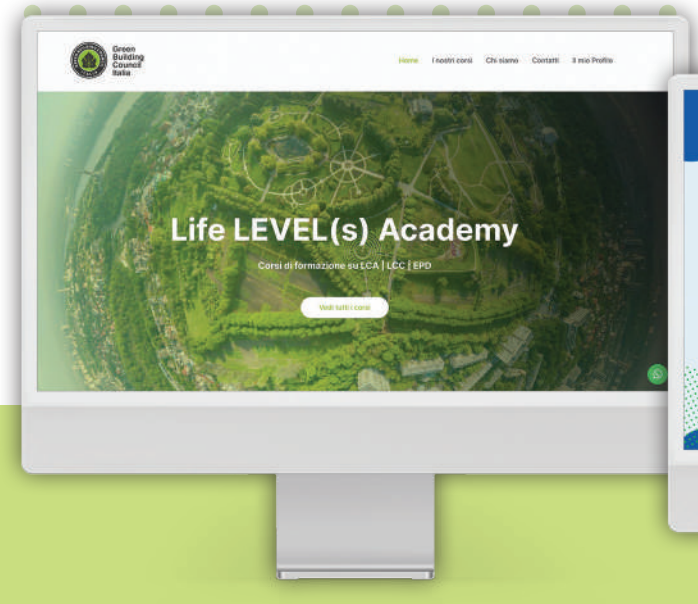
European training initiative to raise the capacities of buildings sector stakeholders on the use of Level(s) and whole life cycle thinking:




**1407**
professionals trained

**592**
manufacturers and suppliers

**584**
public procurers and representatives of local, regional and national bodies




▲ *8. LIFE Level(s) online training by GBC Italia*


▲ *9. LIFE Level(s) online training by Irish GBC*

# European added value

## Two Europe-wide webinars on integration of Level(s) with green building certification schemes

Project webinar on which the mapping exercise on the alignment of Level(s) and national certifications schemes was presented, including the opportunities of using a common Level(s) conform reporting template, had **participation of 70 stakeholders who participated in the testing phase of Level(s)**. It also received support from ***DG Environment, European Commission, Architects Council of Europe, Danish Association of Architectural Firms,*** and ***ECO Platform***.

Another European **webinar was organized for green building councils outside the consortium** on which the mapping tool and reporting template for reporting on all Level(s) indicators in a common, uniform way, was shared.

## Partner inspired for sustainability certification of buildings

Success of testing the alignment of Level(s) indicators with green building certifications **inspired Croatia Green Building Council, the only LIFE Level(s) partner that is not providing certification, to become the DGNB system partner** and integrate the DGNB certification system on Croatian market.

## Three dozen European industry stakeholders consulted on product data availability

With provided consultancy of Cambridge Architectural Research and Ecómetro, when developing the two sets of recommendations on data to be used for countries with no generic data – **36 stakeholders from Ireland, Italy, Croatia and Spain representing industry and academia participated in national consultations for those countries**[1][2]

1 Ruiz Amador D., Tumini I. 2021. Rules and recommendations for the development of a national database of construction materials.

2 Cambridge Architectural Research Ltd. 2021. Availability, quality and use of construction product LCA data Ireland, Italy and Croatia

## European consultation with public procurers and share of best practices

When defining the barriers and requirements that public procurers face in Europe, **177 procurers Europe-wide participated in the project consultation process**.

**9 European public construction projects** from Germany, Italy, Finland, Croatia, Netherlands, France and Ireland **provided their learnings and knowledge as best practice examples of inclusion of Level(s) indicators** into public procurement tenders – all can be found in the Best Practice Guide.

With a goal of raising the awareness and supporting the integration of Level(s) into public procurement, **more than 80 commitments from European public procurers and industry representatives were collected across the partner countries**.

## Europe-wide Level(s) capacity building programs up and running

Training initiative on Level(s) indicators LCA, LCC, IAQ and the use of EPD's carried out throughout Europe by partner green building councils resulted in **1407 professionals trained** (professionals, designers, consultants, certifiers, building firms), **592 manufacturers and suppliers**, and **584 public procurers and representatives of local, regional and national bodies**.

# Words from the LIFE Level(s) team

*In Italy the application of the life cycle approach to design and construction of buildings is not mainstream yet. Just some forward looking and innovative companies are adopting it in the current practice.*

*GBC Italia's Life Levels training activities have raised a large interest on national stakeholders, mainly professionals and public authorities, willing to build competences in this field. The recent publication of the new GPP criteria for buildings (CAM edilizia) in July 22, includes the reference to Level(s) and the use of LCA as awarding criteria for public tenders. This updated version is the result of the advocacy work taken on by GBC Italia, including the activities developed in B3 action of the Lifelevels project, in collaboration with relevant national stakeholders.*

**Valentina Marino,**
**GBC Italia**

**Hadrien Planel,**
**Alliance HQE-GBC**

*In France, the new regulation enforcing the use of LCA to assess the carbon footprint of construction project has created a blindspot on the other environmental indicators. The Level(s) framework highlights a global approach to sustainable building, and working with European GBCs to promote this vision has been a real asset for us, broadening our horizons on IAQ and LCC.*

**Laetitia Nossek,**
**DGBC**

*In the Netherlands, the Level(s) framework has spiked the discussion about the importance of uniform data across Europe. The collaboration between GBC's is an important step - consistency is key and a pillar stone to measure sustainability in the building sector.*

*The LIFE level(s) project is now part of my life: it made it possible for me to join into a network of pioneers on sustainable buildings across Europe; it has stirred the sector and connected the dots between decarbonization, responsibility, transparency and policy making; and it is fruitfully sparking other consortia, financing and projects for the coming years.*

**Borja Izaola,**
**GBCe**

**Stephen Barrett,**
**IGBC**

*Here in Ireland, LifeLevels has really helped spread the word on the importance of sustainability in buildings and consistent measuring – the response to our Whole Life Carbon course was phenomenal, with full classes continuing to join us almost every month to learn about LCA and the carbon profile of a building over its entire lifetime. The next step is to use Level(s) and the data, tools and knowledge that came out of LifeLevels in new studies to more fully understand the impact of how we build today and how we can improve.*

*Mapping the differences between the Level(s) Framework and our local RTS System will help in communicating with international stakeholders on the sustainability of our building stock. We are a small market so we benefit from a common language in attracting foreign investments.*

**Miisa Tähkänen**

*The courses we provided as part of LIFE Level(s) were well received and showed clear signs of an industry in transition willing to transform.*

**Anna Braune**

*The implementation of the LIFE Level(s) project encouraged Croatia GBC to push the national stakeholders towards whole life cycle thinking more effectively than before. Now, we are having discussions with product manufacturers about life cycle assessments in developing environmental product declarations, and addressing sustainability criteria in public procurement tenders with national authorities. On top of all, LIFE Level(s) inspired CGBC to bring the buildings certification process to Croatia and address buildings performance through the whole life cycle.*

**Benjamin Petrović**