Development of the Whole Life Carbon baseline for buildings in Spain

Annexes

INDICATE

GBCe

UNIVERSIDAD DE SEVILLA

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1. Sustainability Certification Schemes in Spain

BREEAM

According to the BREEAM website in Spain, since its implementation in 2010 until now, there are 2,200 certified buildings and 789 registered.

https://breeam.es/buscador-de-proyectos-breeam/

LEED

Since its first registered building in Spain in 2005, it has experienced significant growth, positioning Spain as the leader in the number of LEED project certifications in Europe, with 842 certified buildings (April 2024).

https://www.usgbc.org/projects

VERDE-GBCE

Since its first certification in 2012, 170 buildings have been certified and 347 are registered. GBCE has initiated a support process for entities and developers to establish requirements and include sustainability technical criteria in their bidding documents. This involves training their technicians and managers to introduce and internalize sustainability in construction and promote the progressive implementation of VERDE Certification. This includes organizations like the Society of Penitentiary Infrastructure and Equipment (SIEPSE), the State Company for Industrial Participation and Business Development (SEPIDES), and the developer Metrovacesa.

https://gbce.es/sistemas/verde/

DGNB-System ES

Since 2019, GBCe has been an official partner of the DGNB system and acts as a certification body for DGNB projects in Spain. The system has been adapted to the construction reality and Spanish regulations. The DGNB-System ES scheme began with a pilot phase, which has now concluded. So far, 2 buildings have been certified, and there are 8 more registered. Considering the assessment under the DGNB-System International scheme, 4 additional buildings have been certified.

https://gbce.es/sistemas/dgnb/
https://www.dgnb.de/en/certification/dgnb-certified-projects

ECÓMETRO

includes a set of tailored tools.

https://ecometro.es/es

In INDICATE-Spain, we have a direct connection with the certifications from GBCE (VERDE and DGNB-System ES) as a partner in the project, and an indirect connection with Ecómetro, one of our collaborators.

2. Key Stakeholders

The stakeholders who have participated in the development and validation of the methodology are:

National ministries and relevant governmental agencies. A nivel estatal:

- As observers: MIVAU, Ministry of Housing and Urban Agenda (formerly MITMA), responsible for the GBCE Building Code. Under its annual agreement with MIVAU, it keeps the ministry informed of the project's progress; Spanish Office for Climate Change (OECC).
- The Eduardo Torroja Institute of Construction Sciences (IETcc), part of the Higher Council for Scientific Research (CSIC): IETcc is the technical authority responsible for the Spanish Building Code (CTE).

Local administrations:

- IBAVI: Balearic Institute of Housing.
- AMB-IMPSOL: Metropolitan Area of Barcelona Authority and Metropolitan Institute for Land Promotion and Heritage Management.

Industry:

- Construction institutes: Castilla y León (ICCL), Catalonia (ITeC), Valencia (IVE).
- Software developers: Cype, Ecómetro-ACV, One Click LCA, TCQi-GMA (ITeC) and Turia (IVE).
- LCA consultancies: Mace-Spain, Zero Consulting.

Academia and professional associations:

- AUS-COAC: Architects for Sustainability from the Official College of Architects of Catalonia (COAC).
- CATEB: College Of Technical Architects of Barcelona.
- Certification Green Building Council España SL.
- Research Group on Quality of Life in Architecture (CAVIAR) at the University of the Basque Country.

3. Validation of the methodology for synthetic cases by collaborators

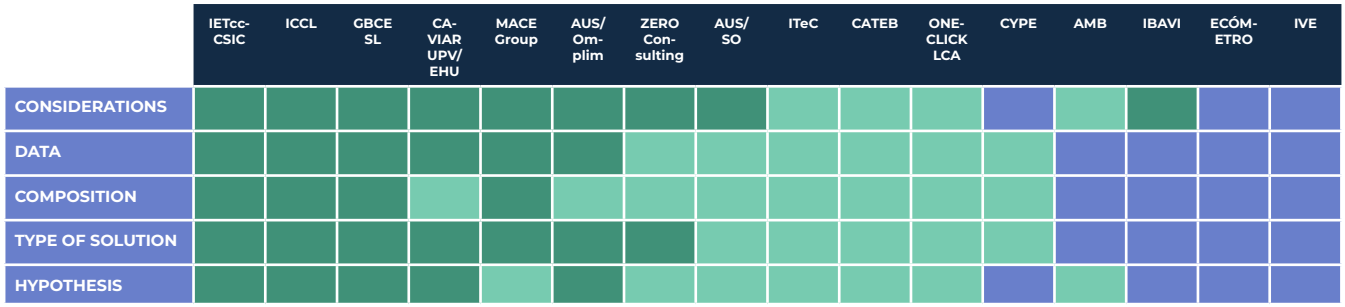
3.1 Procedure

As part of the project development, two surveys were conducted with the collaborators involved in the methodology development and validation of INDICATE-ES. All partners participated in both surveys. The first survey, carried out during the first year, helped shape the initial hypotheses and refine the final methodology. The second survey, conducted a few months after the project's conclusion, was used to confirm that collaborators "mostly agree" or "completely agree" with the methodology developed for the synthetic cases, always within the research framework of the project. At the end of the validation process, a survey was sent to the collaborators to gather their feedback.

3.2 Survey results

Collaborators views were collected on five aspects:

1. **CONSIDERATIONS:** Describe the main aspects of the methodology. Describes the main aspects of the methodology. Reference is made to the file 'methodological considerations v6' which can be consulted in the repository indicated in section 3.4. and in the project credits.
2. **DATA:** Impacts and sources of data for the cases of minimum impact, maximum impact, and modal cases.
3. **COMPOSITION:** Composition and elements of each archetype. Details the sub-elements and materials that make up the construction solutions.
4. **TYPE OF SOLUTION:** Solutions for minimum, maximum, and modal scenarios (archetypes).
5. **HYPOTHESES:** Calculation hypotheses (Stage assumptions) and estimates made to model the modules A4, A5, B1-B7, C1-C4, as well as to perform estimates for installations, etc.



- No comments regarding this
- I completely agree
- I mostly agree
- I'm not convinced, but I understand that this is a starting point that can be modified later
- I do not agree at all, and I think it should be changed

This survey refers to the documents collected in the folder "Encuesta mayo 2024" of the web data repository indicated on the back cover. Subsequent changes can be found summarised in section 3.3.

The responses in this survey refer to the context of the research project. Any other use of the data/ methodology obtained outside the project environment should be analysed according to the specific objective. The use of the ratios for a regulatory application or for use in public tenders would require some aspects to be further elaborated, specified and nuanced. This is very important, not only to ensure good implementation, acceptance and confidence in the sector, but also to avoid possible inconsistencies with applicable regulations or standards.

3.3 Clarifications on the project's evolution beyond the validation process

After the final survey was carried out, some adjustments were made as a result of the evolution of the project itself. On the one hand, corrections were made to the structure of the files that make up the data framework. On the other hand, some improvements were identified, in many cases thanks to the intervention of the contributors. The final adjustments to the repository are recorded.
In summary, they arethe followings:

- **Inclusion of lifts in the calculation.**
  Modified aspects: "1. Considerations" and "5. Hypotheses (Stage assumptions)"
  Description of the adjustment: Added impacts related to lifts.

- **Adjustments to the configuration of some building systems**
  Modified aspects: "3. Composition, and "4. Type of solution".
  Description of the adjustment: The compatibility of construction systems, such as slope-forming and hedging systems, was analysed in detail.

- **Adjustments in distance estimation module A4.**
  Modified aspects: "5. Hypotheses (Stage assumptions)".
  Description of the adjustment: Description of the adjustment: The installation intensity ratio was modified for each use: residential, office, and parking. For other types of materials that are not shipped in bulk and are transported exclusively by road, the decision was made to simplify the procedure instead of carrying out a detailed modelling process in QGIS for each material, as originally planned. An average distance of 600 km was estimated through simplified modelling in QGIS, and this distance has been uniformly applied to all materials.

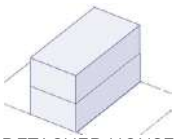
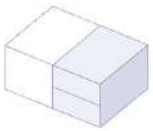
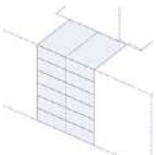
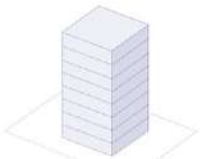
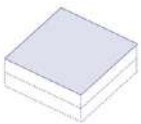
3.4 Repository of data and documentation on the project

The assumptions, data and solutions finally considered are those presented in this report and annexes and can be consulted in more detail in the following web repository:

Web data repository: https://hdvirtual.us.es/discovirt/index.php/s/xwcd373AXfPjoig
Password: INDICATESpain

4. Types considered

SUMMARY OF CONSIDERED TYPES IN INDICATE-SPAIN

USE	CODE	DESCRIPTION	CHARACTERISTICS		
RESIDENCIAL	SpR1	 DETACHED HOUSE (2 storeys)	Number of floors above ground [n]	2,00	U.
			Number of floors below ground [n]	0,00	U.
			Number of houses [n]	1,00	U.
			Total Gross Floor Area (GFA) [m2]	172,96	m2
			Total Usable area (UFA) [m2]	141,82	m2
			Total Useful Internal Floor Area Level(s) [m2]	146,78	m2
			Total Heated Floor Area (HFA) [m2]	141,82	m2
	SpR2	 TERRACED HOUSE (2 storeys) *	Number of floors above ground [n]	2,00	U.
			Number of floors below ground [n]]	0,00	U.
			Number of houses [n]	1,00	U.
			Total Gross Floor Area (GFA) [m2]	158,81	m2
			Total Usable area (UFA) [m2]	129,20	m2
			Total Useful Internal Floor Area Level(s) [m2]	154,05	m2
			Total Heated Floor Area (HFA) [m2]	127,47	m2
	SpR3	TERRACED BUILDING (3 storeys) *	Number of floors above ground [n]	3,00	U.
			Number of floors below ground [n]	0,00	U.
			Number of houses [n]	10,00	U.
			Total Gross Floor Area (GFA) [m2]	1.021,95	m2
			Total Usable area (UFA) [m2]	814,73	m2
			Total Useful Internal Floor Area Level(s) [m2]	991,33	m2
			Total Heated Floor Area (HFA) [m2]	772,94	m2
	SpR4	 TERRACED BUILDING (6 storeys) *	Number of floors above ground [n]	6,00	U.
			Number of floors below ground [n]	0,00	U.
			Number of houses [n]	42,00	U.
			Total Gross Floor Area (GFA) [m2]	4.653,29	m2
			Total Usable area (UFA) [m2]	3.708,73	m2
			Total Useful Internal Floor Area Level(s) [m2]	4.307,38	m2
			Total Heated Floor Area (HFA) [m2]	3.294,23	m2
	SpR5	 APARTMENT BLOCK (10 storeys)	Number of floors above ground [n]	10,00	U.
			Number of floors below ground [n]	0,00	U.
			Number of houses [n]	86,00	U.
			Total Gross Floor Area (GFA) [m2]	9.753,26	m2
			Total Usable area (UFA) [m2]	7.414,54	m2
			Total Useful Internal Floor Area Level(s) [m2]	8.568,02	m2
			Total Heated Floor Area (HFA) [m2]	6.595,51	m2
OFICINA	SpO1	OFFICE BUILDING (3 storeys)	Number of floors above ground [n]	3,00	U.
			Number of floors below ground [n]	0,00	U.
			Number of houses [n]	0,00	U.
			Total Gross Floor Area (GFA) [m2]	1.458,64	m2
			Total Usable area (UFA) [m2]	1.173,79	m2
			Total Useful Internal Floor Area Level(s) [m2]	1.334,22	m2
			Total Heated Floor Area (HFA) [m2]	1.167,76	m2
PARKING	SpP1	 BASEMENT PARKING (2 storeys above ground)	Number of floors above ground [n]	0,00	U.
			Number of floors below ground [n]	2,00	U.
			Number of houses [n]	0,00	U.
			Total Gross Floor Area (GFA) [m2]	5.491,64	m2
			Total Usable area (UFA) [m2]	5.373,61	m2
			Total Useful Internal Floor Area Level(s) [m2]	5.373,61	m2
			Total Heated Floor Area (HFA) [m2]	0,00	m2

(*) Concept and graphics extracted from the '(01) Segmentation of the residential housing stock in Spain into typological clusters Study (01) for the ERESEE 2020 'Long-Term Strategy for Energy Rehabilitation in the Building Sector in Spain' Subdirectorate General of Urban Policies, General Directorate of Architecture, Housing and Land, Ministry of Public Works. March 2019."

Figure 1 - Summary of types considered in INDICATE-Spain.

5. Detail analysis of the results

5.1 Life cycle carbon emissions by module

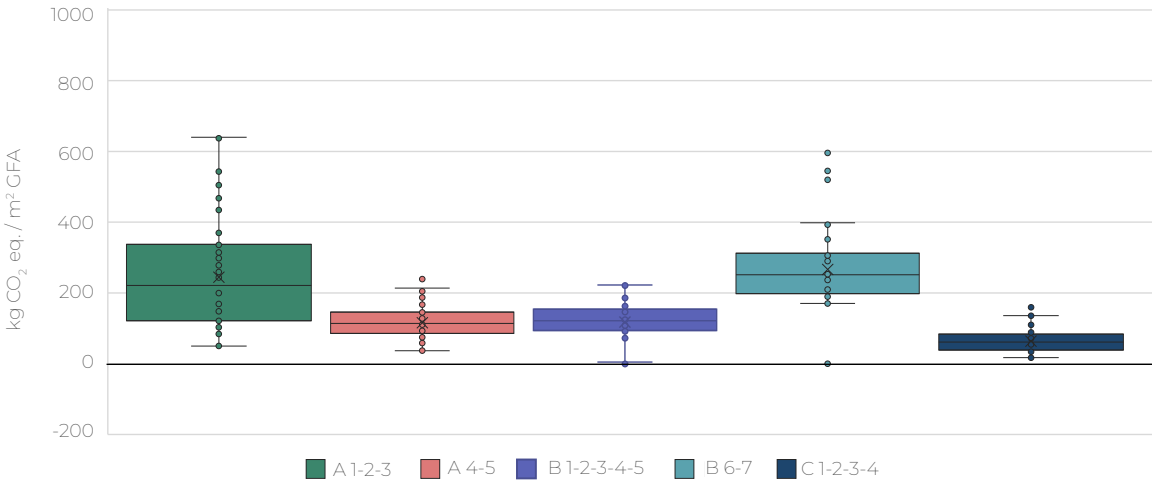


Figure 2 - Synthetic cases. Overall results according to life cycle information modules, aggregated values for residential buildings, offices, and parking spaces.

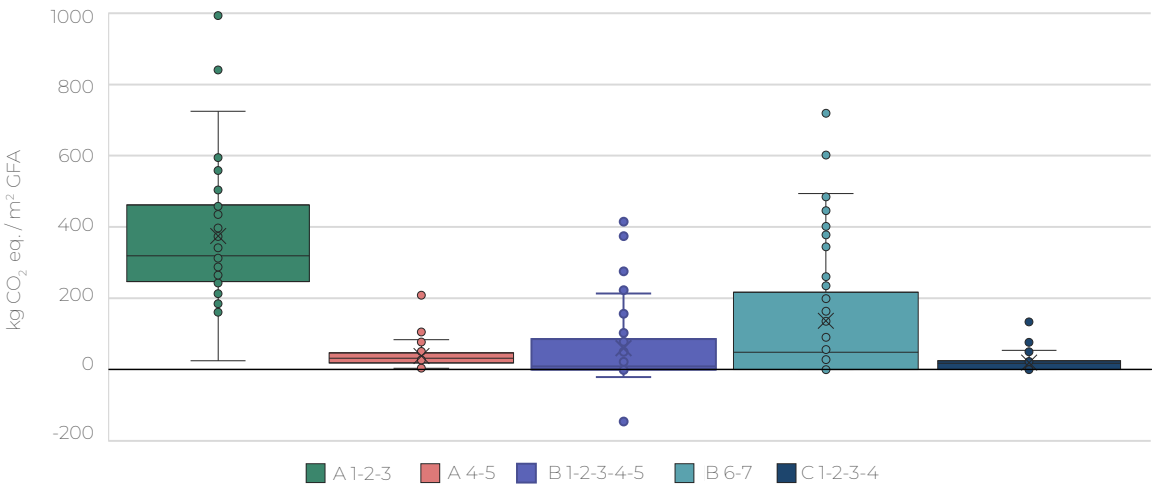


Figure 3 - Real cases. Overall results according to life cycle information modules, aggregated values for residential buildings (with and without parking) and offices.

In the real cases, the negative values in modules B1-2-3-4-5 are due to carbon capture through carbonation of cementitious products, accounted in module B1 and carbon capture in biogenic materials, accounted in B4, which includes the replaced materials. In those cases, it is observed that carbon capture during the product phase (A1), accounted as -1, has not been balanced out with an equivalent positive impact in C3 (+1) when the biogenic carbon that is released at the end of life, as defined by the EN 15804 standard (EN, 2012).

Figure 3 shows the distribution of the B modules, where the highest influence is given by module B4. This tendency is observed in all the archetypes excepting the parking, where the replacement are lowers and the other modules (B1, B2, B3 and B5) have a higher influence in the total results.

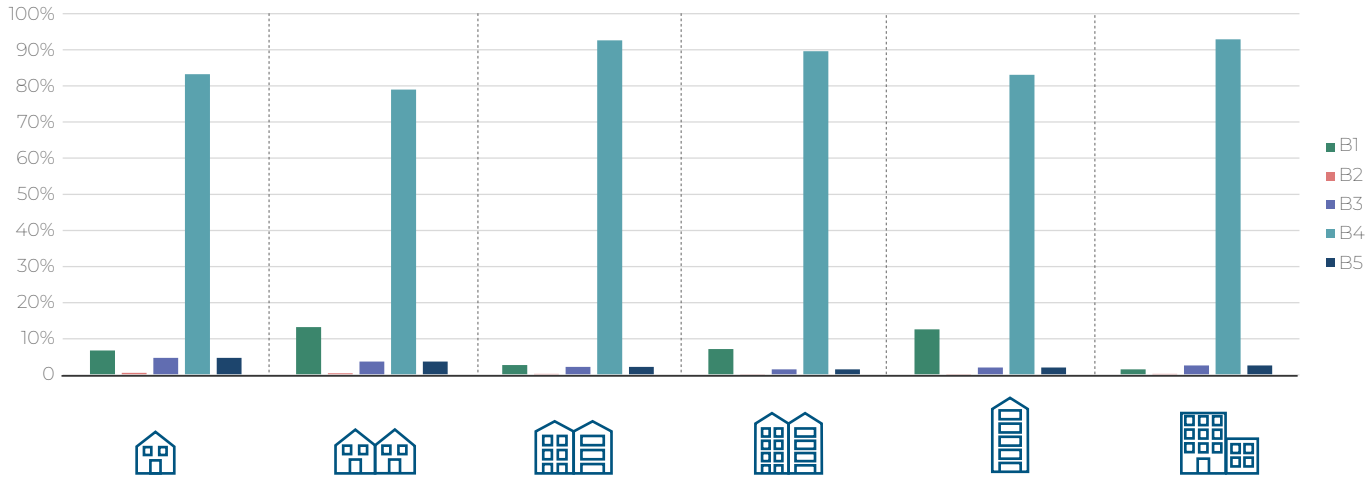


Figure 4 - Synthetic cases. Disaggregated results of modules B1-B5 for residential and office buildings, non-seismic modal archetypes.

5.2 Life cycle carbon emissions by building systems

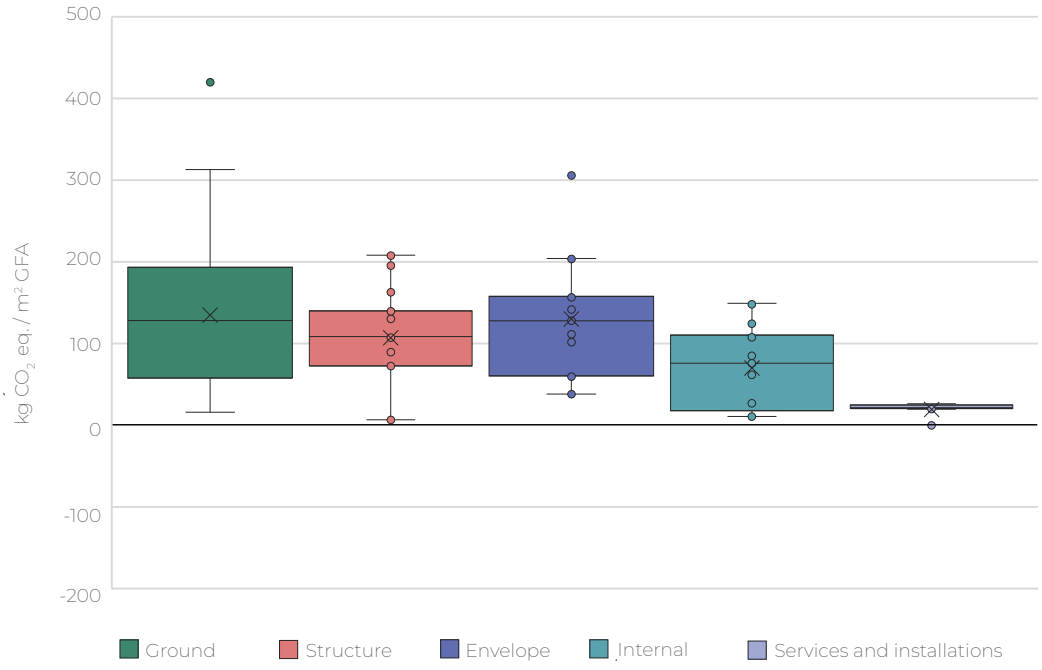


Figure 5 - Synthetic cases. General results organized by the systems comprising the building, aggregated values for residential buildings, offices, and parking spaces.

In both the real cases and the synthetic cases, it can be seen that the foundations, structure and building envelope have a major impact on the impacts incorporated.

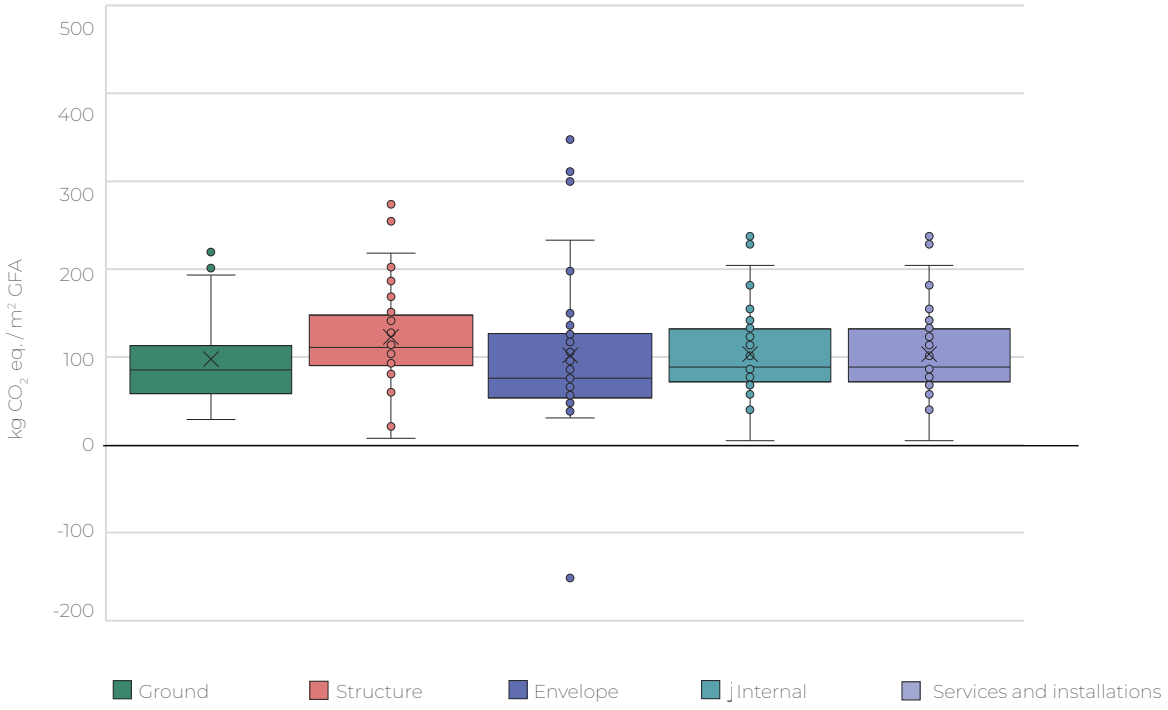


Figure 6 - Real cases. General results organized by the systems comprising the building, aggregated values for residential buildings (with and without parking) and offices.

5.3 Analysis of the Behaviour of the Variables Considered in the Study

The ranges of the synthetic cases are formed by the combination of variables: the upper values are derived from maximum impact construction solutions, using generic data, high mechanical strength due to a seismic zone location, and high thermal resistance. The lower values result from the combination of minimum impact construction solutions, using specific data, normal mechanical strength due to a non-seismic zone location, and low thermal resistance. This section analyses the effect these variables have on the results: the data source, mechanical strength, and thermal resistance.

Analysis of the variation in data sources

In the following, the variation of the environmental data of the 5 materials with the highest mass in the buildings studied is analysed. Table 5 (real and synthetic data) includes the list of the 5 most relevant materials of the real and synthetic cases used in the calculation, the data are expressed in kg of CO2 equivalent per kilogram of material.

Table 1 - List of materials most commonly used in real and synthetic cases.

Real cases	Synthetic cases
Aluminium (e.g. alum alloy)	Cement - CEM II/B-S (<35% GGBS)
Cement mortar/ plaster	Clay - Expanded clay
Ceramics (e.g. fired clay bricks)	Clay - Tile
Concrete reinforced	Concrete - In-situ, 25/30 MPa
Concrete w/o reinforcement	Concrete Block
Earth (e.g. unfired clay/ adobe/ rammed earth/ etc.)	Metals - Reinforcing steel
EPS or XPS (insulation)	Metals - Steel, electrogalvanized steel
Glass (single/ double/ triple)	Mortar - Bond Coat
Metals (iron/ steel)	Mortar - Mortar (1:3 cement:sand mix)
no data	Plasterboard (gypsum)
Other	Stone -General Stone
Plastics (various: PC/ PE/ PP/ PU/ PVC)	Timber -Fibreboard
Steel (reinforcement)	Timber -Swedish C24 timber
Stone (granite/ limestone/ etc)	
Stone wool (e.g. insulation)	
Timber/ wood	

In general, it is observed that material families such as metals, cementitious materials, or wood are common in both types of cases. If we analyse aspects such as the variability in the data sources of the synthetic cases, it becomes evident that some types of data may present greater variability than others.

Some examples illustrating the degree of dispersion in this data include steel (Metals – reinforcing steel), which shows the highest variation, with a range between 1.03 and 2.80 kg of CO2 eq. per kilogram of material. An example of low dispersion is plasterboard (gypsum), where the data variability is very low. This range of data included in the synthetic cases corresponds to 3 types of data: 1) increased generic data from ecoinvent v 3.10; 2) modal data constructed from EPDs (statistical averages); 3) specific data from EPDs.

Impact factors of materials used in synthetic cases

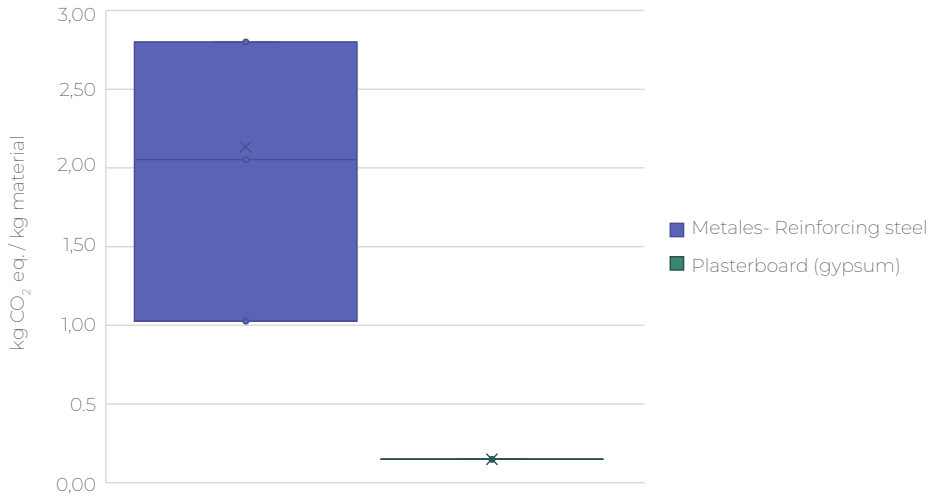


Figure 7 - Synthetic cases. Example of variation in impact factors according to the data sources used.

Analysis of the variation of construction solutions against the thermal resistance (envelope) and seismicity (structure) ranges considered.

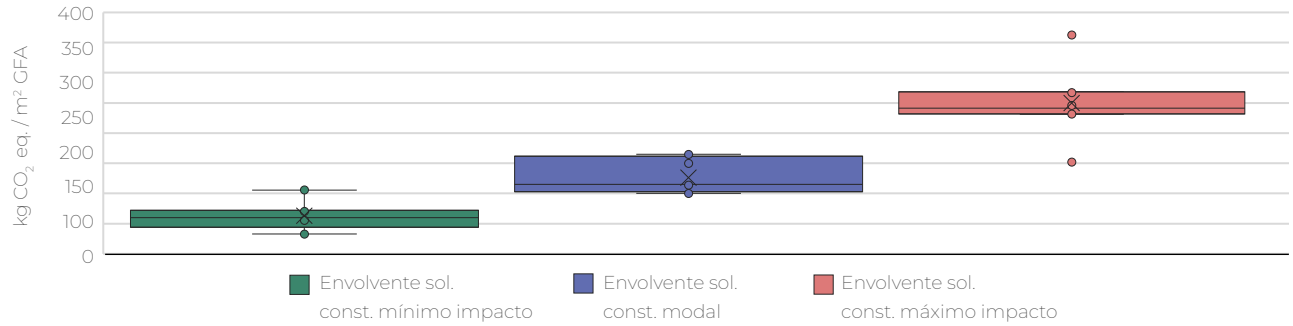


Figure 8 - Synthetic cases. Total results for the building envelope according to the type of construction solution.

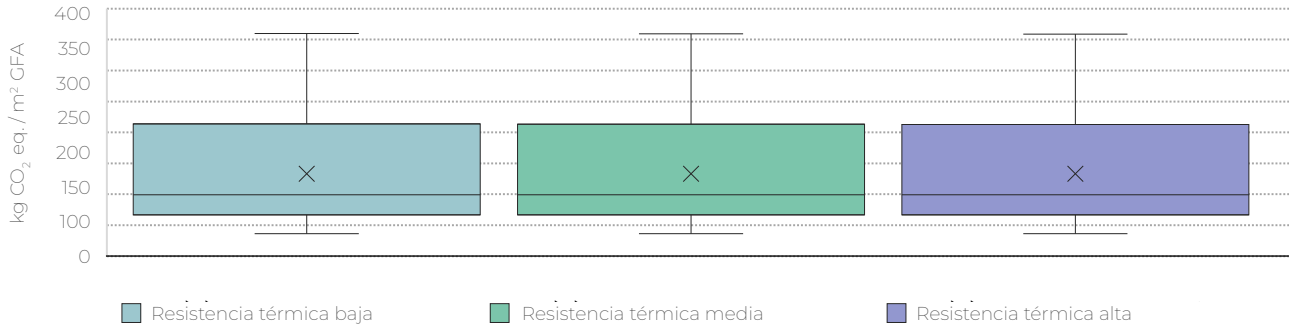


Figure 9 - Synthetic cases. Total results for the building envelope according to climate severity.

Figure 8 shows the variation of the envelope results according to the three types of building solutions considered, minimum impact solution (orange colour; modal solution (green colour) and maximum impact solution. Figure 9 shows the variation of the impacts of these solutions depending on the climatic severity considered. It therefore shows that the impact of the construction solution, i.e. the materials with which the building is constructed, is greater than that of the thermal resistance of the solution, i.e. the thickness of the materials that make up the solution.

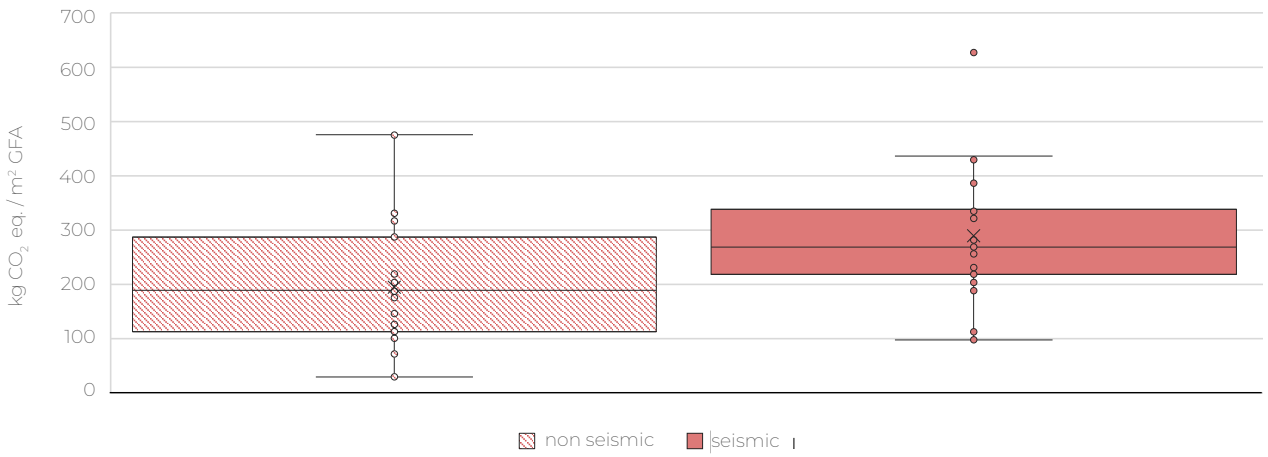


Figure 10 - Synthetic cases. Total results for foundations and structure according to seismic zone.

Figures 9 and 10 show that the maximum value of the series is given by the single-family detached house typology (627 kg CO2 eq./m2GFA), this value is reflected as an outlier in the series. The maximum value of the non-seismic structures dataset reflects that the maximum value is also for the single-family detached house (475 kg CO2 eq./m2GFA), in this case it corresponds to the upper end of the series.

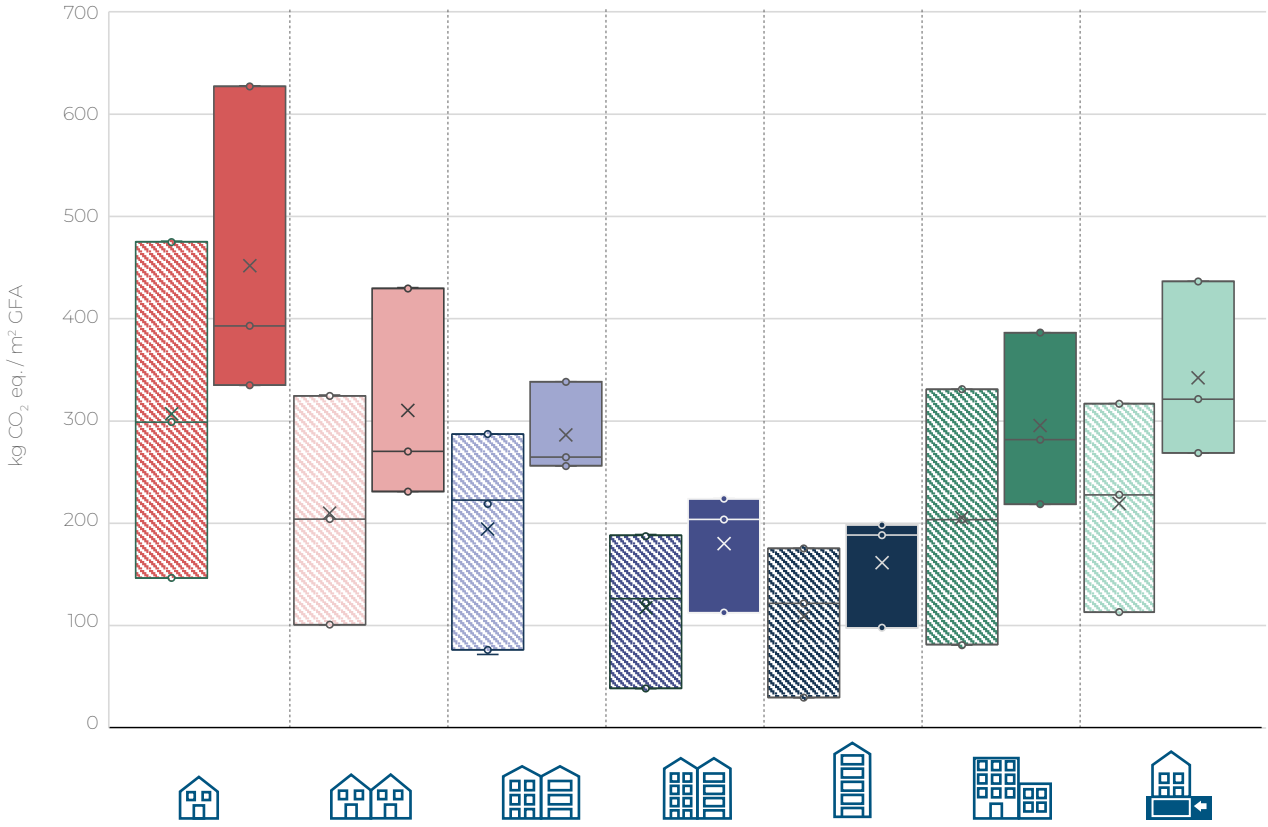


Figure 11 - Synthetic cases. General results for foundations and structure by typology according to seismic zone.

Figures 9 and 10 show the impact of seismic activity on the emission results generated by the structure and foundation. Therefore, it is demonstrated that the seismicity of the structure is highly relevant to the impacts generated by the structure and foundation of buildings. In some cases (detached single-family homes, terraced single-family homes, multi-family housing with fewer than three storeys), this impact can be more than three times greater.

6. Definition of Floor areas

Type of floor area	Definicion	Source
“Gross Floor Area CTE Spain”	Area included within the exterior line of the perimeter parameters of a building and, where applicable, of the axes of party walls, deducting the area of light courtyards. Balconies, terraces, porches and other similar elements, which are covered, will be computed at 50% of their surface area, unless they are closed on three of their four sides, in which case they will be computed at 100%. In residential use, Spaces with a height of less than 1.50 metres shall not be counted as built surface area.	RD 1020/1993 on technical valuation rules and the framework table of land and building values to determine the cadastral value of urban real estate. https://www.boe.es/eli/es/rd/1993/06/25/1020
“Usable Internal Floor area Level(s)” Internal area.	See document part 2 Level(s) “User manual 2: Setting up a project to use the Level(s) common framework (pag 24) • Office building: IPMS measurement standard 3 • Residential building: IPMS measurement standard 3B	International Property Measurement Standards (IPMS) https://ipmsc.org/archive/ https://susproc.jrc.ec.europa.eu/product-bureau/product-groups/412/
“Usable Internal Floor area Level(s)” Balconies and terraces.	See document part 2 Level(s) “User manual 2: Setting up a project to use the Level(s) common framework (pag 24) • Office building: IPMS measurement standard 3 • Residential building: IPMS measurement standard 3B	International Property Measurement Standards (IPMS) https://ipmsc.org/archive/ https://susproc.jrc.ec.europa.eu/product-bureau/product-groups/412/

Type of floor area	Definicion	Source
“Usable floor area”	It is the floor area delimited by the perimeter defined by the inner face of the external enclosures of a building or of a building element, including half of the floor area of its covered outdoor spaces for private use (such as terraces, balconies and clotheslines, porches, loading bays, overhangs, etc.), measured on the horizontal projection of its roof. The area occupied on the ground floor by fixed interior enclosures, by vertical structural elements, and by pipes or conduits with a horizontal section greater than 100 cm2 and the floor area whose free height is less than 1.5 metres shall not be considered as usable area. The area occupied by uncovered outdoor spaces shall also not be considered as usable area.	Order ECO/805/2003
“Usable (living) floor area for TOTAL private (housing or office)”	It is the sum of the usable areas of the living spaces included within the thermal envelope. Usable floor area being the floor area delimited by the perimeter defined by the inner face of the external envelope of a building or building element, including half of the floor area of its covered outdoor spaces for private use (such as terraces, balconies and clotheslines, porches, loading bays, overhangs, etc.), measured on the horizontal projection of its roof. A habitable space is the space formed by one or more contiguous habitable enclosures with the same use and equivalent thermal conditions grouped together for the purposes of energy calculation. The area occupied on the ground floor by fixed interior enclosures, by vertical structural elements, and by ducts or conduits with a horizontal section greater than 100 cm2 and the floor area whose free height is less than 1.5 metres shall not be considered as useful area. The area occupied by uncovered outdoor spaces shall not be considered as usable area either.	DBHE 2022 https://www.codigotecnico.org/pdf/Documentos/HE/DBHE.pdf

Type of floor area	Definicion	Source
“Usable floor area for parking”	It is that which, being located in built-up space, is constituted by the surface area formed by the delimitation of the access and circulation roads. The usable surface area of a surface or porch parking space that is not enclosed on all sides is that which, being located in a private space that is not built on, is made up of the surface area formed by the delimitation of the space itself.	https://www.aparejadoresmadrid.es/documents/20194/36447/GT778.pdf
“Usable area for communal areas”	It is that of the floor of the same, enclosed by the perimeter defined by the inner face of its enclosures with the exterior or with other dwellings and premises or areas of any use.	Own elaboration
“Usable floor area for others uses”	It is that of the floor of the same, enclosed by the perimeter defined by the inner face of its enclosures with the exterior or with other dwellings and premises or areas of any use.	https://www.aparejadoresmadrid.es/documents/20194/36447/GT778.pdf
“Heated Floor Area”	Heated floor area is defined as the sum of the usable floor area, including all above-grade heated areas regardless of ceiling height and all below-grade heated areas such as basements with a ceiling height of more than 1,2 m (basements with a ceiling height of more than 1,2 m). Heated floor area is defined as the sum of the usable floor area, including all above-grade heated areas regardless of ceiling height and all below-grade heated areas such as basements with a ceiling height of more than 1,2 m (4 ft.).	https://www.lawinsider.com/dictionary/heated-floor-area#:~:text=The%20following%20formulas%20for%20common,m%20(4%20ft.)

7. INIES-based model for the production of Default Environmental Data (DED)

Source INDICATE-ES based on INES, « Procédure de développement de données environnementales par défaut (DED) relatifs aux produits de construction et équipements pour une utilisation dans la méthode d’évaluation de la performance énergétique et environnementale des bâtiments neufs »

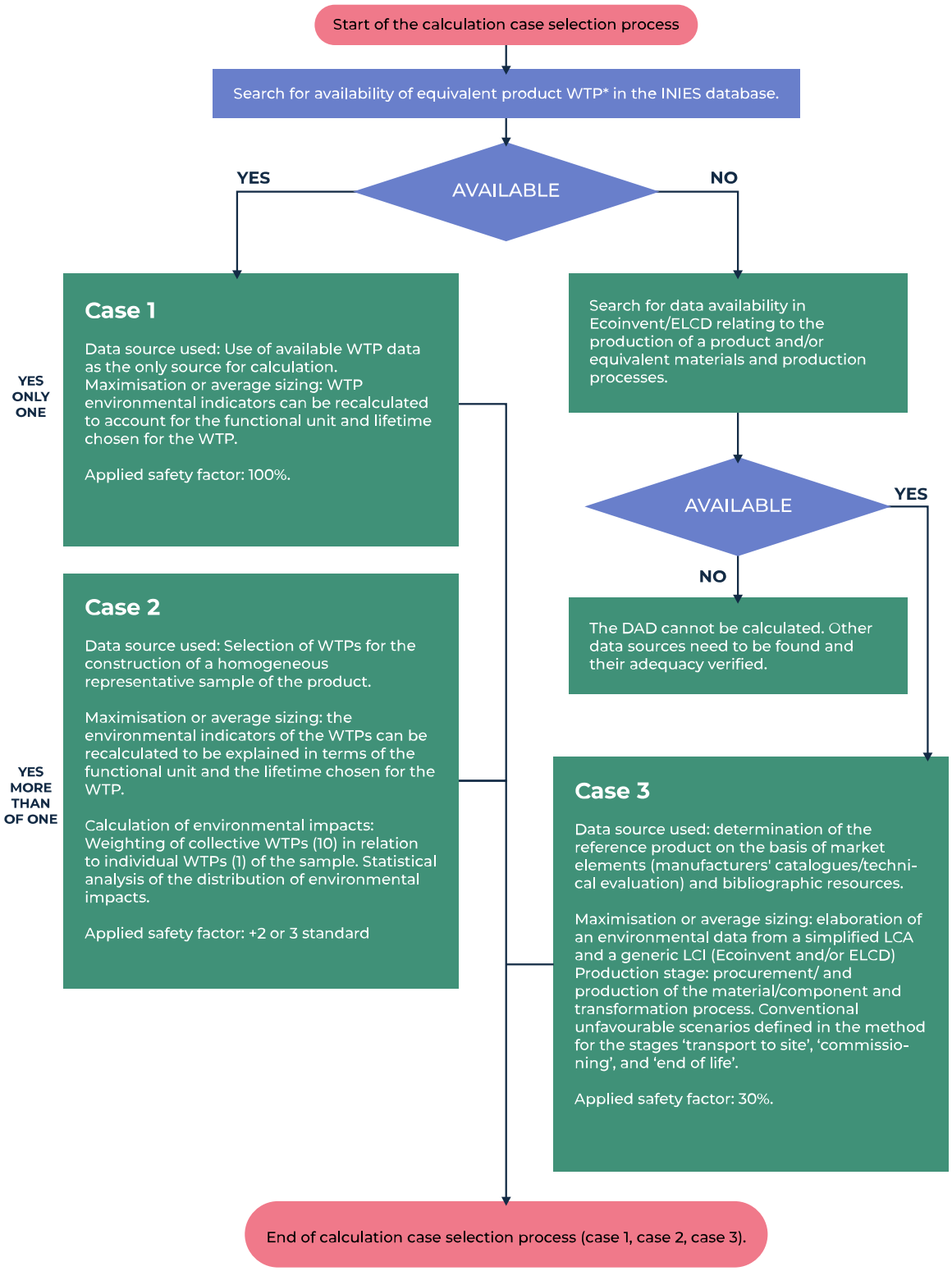


Figure 12 - Procedure for the development of Default Environmental Data (DAD) based on INIES.

The specific data used in INIES are PEP and FDES. PEP stands for Product Environmental Profile, it is an environmental declaration for electrical, electronic or HVAC equipment based on the results of its LCA. FDES is the Environmental and Health Declaration Sheet. which will be published in the second half of 2024. The University of Seville is supporting this task.

https://www.inies.fr/ressources-documentaires/foire-aux-questions/#question-1043

8. Previous related projects of interest

IETcc-1	SOFIAS	
Who?	**What is it?**	
IETcc-CSIC	**Integrated Functions Software for Sustainable Architecture."** **Tool focused on calculating the environmental impact of construction solutions from the Catalogue of Building Elements of the CTE.**	
Relationship with INDICATE-Spain		
Validación de la metodología		
Other entities involved in the initiative		
TECNALIA (nota: investigador actualmente en CAVIAR-UPV/EHU, socio de INDICATE) CIRCE, Cátedra UNESCO (UPF)	http://dx.doi.org/10.3989/ic.15.055	
Where?	**Funding**	**When?**
Spain	**Ministerio de Economía y Competitividad**	**2011-2014**
How?	Integrated with official tools for calculating energy certification. Uses a reference building to assess building performance. The stages A1-A3, A4, A5, B4, B5, B6, and C1 were evaluated. A database with Environmental Reference Values based on Ecoinvent and GaBi was developed. It utilized EPDs from across Europe.	

	Proyecto Hce: arCO2 - VER	
Who	**What is it?**	
Ecómetro Asociación	***Carbon Footprint in Buildings: Protocol and tool for calculating and reducing the Carbon Footprint in construction. It includes the development of the methodology, Estimated Reference Values (ERV), and the arCO2 tool for Life Cycle Assessment (LCA) calculation.***	Proyecto HCe
Relationship with INDICATE-Spain		
Validación de la metodología / Aportación datos		
Other entities involved in the initiative		
IETcc, Oficina Española de Cambio Climático (OECC), ASA, PiAE_Arquitectura, Energía y Medioambiente, Prysma, Base de precios Centro (Guadalajara)	https://fundacion-biodiversidad.es/proyectos_ficha/reduccion-huella-	
Where?	**Funding**	**When?**
	Fundación Biodiversidad	**2014**
How?	Estimated Reference Values (ERV) were generated for stages A1-A3 for the PCG indicator with the aim of integrating them into the official generic database in Spain, OpenDAP, which currently serves as a repository for EPDs. The ECOMETRO association continued this project in what is now ECOMETRO-ACV.	

	OerCO2	
Who	**What is it?**	
Universidad de Sevilla	**Open Educational Resource CO2** Tool for calculating the carbon footprint at all life cycle stages for the most common construction solutions based on generic data from Ecoinvent.	OERCO2
Relationship with INDICATE-Spain		
Socio INDICATE (departamento diferente de la US)		
Other entities involved in the initiative		
Centro Tec. del Mármol, Piedra y Materiales (ES); CertiMaC (IT); Centro Tecnologico da Ceramica e do Vidro (PT); Universitatea Transilvania din Brasov y Romania GBC-	https://oerco2.eu/es/	
Where?	**Funding**	**When?**
Partners: Spain, Portugal, Italy, Rumania.	**European Comission. Erasmus+**	**2016-2018**
How?	The main idea of OERCO2 is to create an Open Educational Resource where the calculations of CO2 emissions at each phase of the building are unified, in order to provide an overview of the carbon footprint from its conception and to make decisions on each variable of the construction process.	

9. Initiatives for Decarbonization by INDICATE Partners and Collaborators

	DECARBONIZATION	ROLE				LEVERS FOR ACTION						
		PARTNER	VALIDATION	DATA CONTRIBUTION	BIM CONTRIBUTION	REGULATION	FINANCING	INNOVATION	COMMUNICATION	CAPACITY BUILDING	MEASUREMENT	COLLABORATION
	INITIATIVES BY PARTNERS AND COLLABORATORS OF INDICATE	1	2	3	4	A	B	C	D	E	F	G
	GREEN BUILDING COUNCIL ESPAÑA (GBCE)	1										
1	**GBCE-1** CERTIFICATION AREA										F	
2	**GBCE-2** MATERIALS PLATFORM							C			F	
3	**GBCE-3** TRAINING PLATFORM							C		E		
4	**GBCE-4** "BUILDING LIFE" PROJECT					A			D		F	G
5	**GBCE-5** "MORE LIFE TO LEVEL(S)" PROJECT					A			D		F	G
6	**GBCE-6** "TOP CLEVER" PROJECT							C	D	E	F	G
7	**GBCE-7** "EUPeers" PROJECT					A	B		D	E	F	G
8	**GBCE-8** GUIDE "DECARBONIZING BUILDING THROUGHOUT ITS LIFE CYCLE"								D			G
17	**GBCE-9** "RehabilitES 2030" PROJECT					A	B	C	D	E	F	G
9	**GBCE-10** RENEWABLE HEATING ROADMAP					A			D		F	G
10	**GBCE-11** "HAPPENING" PROJECT							C	D		F	G
11	**GBCE-12** "IBroad2EPC" PROJECT								D			G
12	**GBCE-13** "BIRTUOSS" PROJECT						B	C	D		F	G
13	**GBCE-14** "Construye 2030" PROJECT									E		G
14	**GBCE-15** "LIFE LEVEL(S)" PROJECT							C		E	F	
15	**GBCE-16** MY DECARBONIZED DIPLOMA									E		G
16	**GBCE-17** "MAKING CITY" PROJECT							C			F	G
18	**GBCE-18** "SMARTER4EU" PROJECT						B				F	
19	**GBCE-19** "AIRE" PROJECT						B		D	E	F	
20	**GBCE-20** "INFORME PAÍS" REPORT								D			G
	UNIVERSITY OF SEVILLE	1										
21	**US-1** "BIM-ZEN " CATALOGUE							C			F	
22	**US-2** "DECIDE" TOOL							C			F	
23	**US-3** IEA EBC ANNEX 89							C			F	G
24	**US-4** IEA EBC ANNEX 72							C			F	G
	ZERO CONSULTING		2	3	4							
25	**ZCO-1** Net Zero Tool							C			F	
	METROPOLITAN AREA OF BARCELONA		2		4							
26	**AMB-1** SUSTAINABILITY PROTOCOL OF AMB-IMPSOL					A			D		F	
	ECOMETRO		2	3								
27	**ECOM-1** ECÓMETRO LCA TOOL										F	
28	**ECOM-2** COURSE "LCA IN CONSTRUCTION"									E		
29	**ECOM-3** ECF - GRANT 2023-2025								D			
30	**ECOM-4** TRANSLATION OF THE RAMBOLL REPORT								D			
31	**ECOM-5** CO2Nulo CERTIFICATION										F	
	BALEARIC INSTITUTE OF HOUSING (IBAVI)		2	3								
32	**IBAVI-1** ARV CATALOGUE. LOW ENVIRONMENTAL IMPACT BUILDING SOLUTIONS							C	D	E	F	
	INSTITUTE OF CONSTRUCTION TECHNOLOGY OF CATALONIA (ITeC)		2	3								
33	**ITEC-1** BEDEC BASE DATA							C			F	
34	**ITEC-2** SOFTWARE TCQi GMA							C			F	
35	**ITEC-3** "SIRCULAR" PROJECT							C	D			G
36	**ITEC-4 /SO-9** "RECONSTRUCT" (with Societat Orgànica) PROJECT							C				G
37	**ITEC-5** "PLURAL" PROJECT							C				
38	**ITEC-6** "RENHOMES" PROJECT							C				G

| | | |

GREEN BUILDING COUNCIL ESPAÑA (GBCE)

1 GBCE-1 — CERTIFICATION AREA

Who?	What is it?	
Green Building Council España (GBCE).SL	Development of measurement and certification systems for buildings and urban developments based on their level of contribution to sustainability.	
Relationship with INDICATE-Spain		
Partner INDICATE		
Other entities involved in the initiative		
DGNB CEPEA	https://gbce.es/certificacion-de-edificios/	
Where?	**Funding**	**When?**
Spain		Continued development
How?	Systems to assess contributions to various sustainability indicators supported by national, European, and global standards and commitments (CTE, Level(s), Taxonomy, EPBD, SDGs, etc.). Various systems based on needs, such as VERDE—170 certified buildings and 347 registered—and support in public and private tenders, DGNB, GBCE verification of the European Taxonomy, etc.	

2 GBCE-2 — MATERIALS PLATFORM

Who?	What is it?	
Green Building Council España (GBCE).SL	Platform for professionals and companies aimed at facilitating environmental information on products and construction systems, showcasing their environmental, social, and economic benefits.	
Relationship with INDICATE-Spain		
Partner INDICATE		
Other entities involved in the initiative		
	https://materiales.gbce.es/	
Where?	**Funding**	**When?**
Spain		Continued development
How?	The Platform presents the information and documentation required by the VERDE, LEED and BREEAM certification schemes to accredit the environmental performance of products and systems, and their contribution to the environmental quality of buildings. This facilitates the work of professionals and developers in the selection and assessment of materials.	

3 GBCE-3 — TRAINING PLATFORM

Who?	What is it?	
Green Building Council España (GBCE).SL	Specialisation courses on key aspects such as decarbonisation, circular economy, and life cycle assessment in buildings.	
Relationship with INDICATE-Spain		
Partner INDICATE		
Other entities involved in the initiative		
	https://gbce.es/cursos-de-formacion/	
Where?	**Funding**	**When?**
Spain		Continued development
How?	It is structured into different options: 1) Certification courses for VERDE and DGNB; 2) Specialisation courses in circular economy, LCA, taxonomy, and health; 3) IN COMPANY training tailored to the company in either face-to-face or online format, functioning through independent modules.	

4 GBCE-4 — "BUILDING LIFE" PROJECT

Who?	What is it?	
Green Building Council España (GBCE)	Initiative to promote climate action in the building sector and achieve the decarbonisation of the built environment throughout its life cycle. Funding: Programa LIFE + IKEA Foundation +Laudes Foundation + European Bank for Reconstruction and Development + European Climate Foundation	
Relationship with INDICATE-Spain		
Partner INDICATE		
Other entities involved in the initiative		
WorldGBC, Irish GBC, Czech GBC, Croatia GBC, Dutch GBC, DGNB, UKGBC, Alliance HQE-GBC France, Hungary GBC, Polish GBC, FIGBC, GBC Italia.	https://gbce.es/proyectos/building-life/	
Where?	**Funding**	**When?**
Europe	Various	2023-2026
How?	1st phase (2020-2022): A European roadmap and national roadmaps in participating countries have been developed to guide the changes to be implemented in the coming years. 2nd phase (2023-2026): It will promote and support concrete actions to implement the national roadmap and will measure the sector's progress. The results of INDICATE-Es will be incorporated.	

5	GBCE-5	"MORE LIFE TO LEVEL(S)" PROJECT

Who?	What is it?	
Green Building Council España (GBCE)	**Initiative that will collect data on the application of Level(s) in 11 real cases, from which the European Commission will create success stories to aid in the dissemination of the Level(s) framework.**	
Relationship with INDICATE-Spain		
Partner INDICATE		
Other entities involved in the initiative		
Green Building Council Denmark Austrian Sustainable Building Council (ÖGNI), German Sustainable Building Council (DGNB)	https://gbce.es/proyectos/more-life-to-levels/	
Where?	**Funding**	**When?**
International	**Programa LIFE**	**2023-2027**
How?	It aims to achieve a comprehensive and in-depth understanding of how the Level(s) framework is applied across different types of buildings throughout Europe. To this end, the real implementation of the framework is monitored in eleven European buildings, from the start of their projects to one year after their occupancy.	

6	GBCE-6	"TOP CLEVER" PROJECT

Who?	What is it?	
Green Building Council España (GBCE)	***Training and Outreach Programmes for a circular and Level(s) based Revolution*** **Training programs for professionals and workers in the construction sector to address the challenge of decarbonisation throughout the life cycle with a circular approach based on Level(s).**	
Relationship with INDICATE-Spain		
Partner INDICATE		
Other entities involved in the initiative		
GBC Italia; Croatia GBC; HuGBC PLGBC; GBC Slovenia; WorldGBC	https://gbce.es/proyectos/top-clever/	
Where?	**Funding**	**When?**
Europe (6 pilot countries)	**Programme Life**	**2023-2027**
How?	These programs will help promote the reduction of carbon emissions throughout the life cycle, circular construction, resource efficiency, and the latest practices related to zero-emission buildings. The training places special emphasis on youth and women and will be part of the launch of the WorldGBC educational platform.	

7	GBCE-7	"EUPeers" PROJECT

Who?	What is it?	
Green Building Council España (GBCE)	***Community for Integrated Home renovation Services*** **Integrated Housing Renovation Services Community (IHRS), including Rehabilitation Agents and One-Stop Shops.**	
Relationship with INDICATE-Spain		
Partner INDICATE		
Other entities involved in the initiative		
Climate Alliance; Energy Cities; GNE Finance Energy Demain; Ekubirojs; ENEA; Regione Piemonte; Fedarene; SEEA;	https://gbce.es/proyectos/eu-peers/	
Where?	**Funding**	**When?**
Europe (6 pilot countries)	**Progamme LIFE**	**2023-2026**
How?	A European IHRS community and six national communities are established through periodic meetings for knowledge exchange, showcasing success stories, and identifying barriers. These communities bring together stakeholders in the building renovation value chain as key instruments to accelerate residential energy rehabilitation in the EU.	

8	GBCE-8	GUIDE "DECARBONIZING BUILDING THROUGHOUT ITS LIFE CYCLE"

Who?	What is it?	
Green Building Council España (GBCE)	***"Decarbonising Buildings Throughout Their Life Cycle – Step-by-Step Guide for Cities"*** **Downloadable guide developed in collaboration with the "Collaboration Platform for Climate Neutrality of Spanish Cities," citiES 2030.**	Descarbonizar la edificación en todo su ciclo de vida Guía paso a paso para ciudades
Relationship with INDICATE-Spain		
Partner INDICATE		
Other entities involved in the initiative		
citiES 2030	**https://gbce.es/proyectos/mision-ciudades/** https://gbce.es/recursos/descarbonizar-la-edificacion-en-todo-su-ciclo-de-vida-guia-paso-a-paso-para-ciudades/	
Where?	**Funding**	**When?**
Spain and cities	**Laudes Foundation and Built by Nature**	**2023-2024**
How?	GBCE designed four collaborative workshops with cities and stakeholders involved in the citiES 2030 platform. A roadmap was proposed and validated with participants. the foundations of the Guide were co-created, and barriers and opportunities at the local level were identified.	

9	GBCE-9	"RehabilitES 2030" PROJECT

Who?
Green Building Council España (GBCE)

Relationship with INDICATE-Spain
Socio INDICATE

Other entities involved in the initiative
citiES 2030

What is it?
Massive Energy Rehabilitation Program in Spanish Cities – RehabilitES 2030. Diagnosis of the Cities, Mission, and Methodology of the Program.

https://gbce.es/proyectos/mision-ciudades/

Where?
Spain (Spanish Mission Cities)

Funding
Fundación Biodiversidad - MITECO

When?
2023-2024

How?
The methodology of citiES was updated for the massive rehabilitation program after learning about the ongoing energy rehabilitation initiatives in Vitoria, Valencia, Valladolid, Madrid, Barcelona, Zaragoza, and Soria. Their needs and opportunities are analyzed to work in a multi-city collaboration with the citiES 2030 platform. Three online sessions were held for knowledge exchange.

10	GBCE-10	RENEWABLE HEATING ROADMAP

Who?
Green Building Council España (GBCE)

Relationship with INDICATE-Spain
Partner INDICATE

Other entities involved in the initiative
Plataforma por la descarbonización ACS/calefacción
ECODES

What is it?
Roadmap that provides an overview of the actions to be taken in Spain by the building sectors, particularly in heating and cooling, to help ensure that global warming does not exceed 1.5 °C.

descarboniza calefacción

https://gbce.es/proyectos/hdrcalacs/

Where?
Spain

Funding

When?
2023-2024

How?
Development of four possible scenarios for reducing CO2 equivalent emissions in the heating and domestic hot water sector to define necessary actions and guidelines. Beyond the Roadmap, the Platform leverages the collective experience and knowledge of its members to facilitate the transformation of heating systems, the building sector, and the energy and ecological transition.

11	GBCE-11	"HAPPENING" PROJECT

Who?
Green Building Council España (GBCE)

Relationship with INDICATE-Spain
Partner INDICATE

Other entities involved in the initiative
GBCe, Tecnalia, CARTIF, Eurac research, Innova, Tecnozenith, AEE INTEC, GWS Fraunhofer, RINA y ANESE

What is it?
Initiative to promote the installation of heat pumps in combination with the production of clean energy.

HAPPENING

https://gbce.es/proyectos/happening/

Where?
Pasaia (Spain); Verzuolo (Italy); Liezen (Austria)

Funding
Horizon 2020

When?
2020-2024

How?
Highly versatile, scalable, and replicable solution package for modernising the energy system in buildings. It enables the achievement of 70-75% renewable energy fraction; 30-50% primary energy savings and GHG reduction; and reduces planning times (50%), installation/operation times (30%), with a payback period for ESCOs and investors of less than 8 years.

12	GBCE-12	"IBroad2EPC" PROJECT

Who?
Green Building Council España (GBCE)

Relationship with INDICATE-Spain
Partner INDICATE

Other entities involved in the initiative
Sympraxis, BPIE, IFEU, TU WIEN, INZEB, BPAC, ENEffect, ADENE, KAPE, URBAN-INCERC, Cíclica

What is it?
Initiative that proposes developing a tool that acts as an intermediary between the energy efficiency certificate and the rehabilitation passport, allowing for the planning and visualization of the comprehensive rehabilitation process.

iBRoad2EPC

https://gbce.es/proyectos/ibroad2epc/

Where?
Europe (6 pilot countries)

Funding
Horizonte 2020

When?
2021-2024

How?
Online documentation has been created for professionals and for communication with non-technical stakeholders. The aim is to design a long-term rehabilitation strategy, with organized step-by-step actions to avoid errors or duplications, while achieving temporal alignment with decarbonisation goals and future obligations.

13	GBCE-13	"BIRTUOSS" PROJECT

Who?	What is it?	
Green Building Council España (GBCE)	Development and expansion of the "Opengela" network of One-Stop Shops for Renovation in the Basque Country.	OPENGELA
Relationship with INDICATE-Spain Partner INDICATE		
Other entities involved in the initiative Gobierno Vasco; EVE; EDE Fundazioa; Gabinete 6; BuildINN; Aclima; GAIA; GNE Finance; Cíclica; Zabala; Viviendas Municipales Bilbao	https://gbce.es/proyectos/birtuoss/	
Where?	**Funding**	**When?**
Basque Country	Progamme LIFE + Basque Government	2023-2026
How?	Building on the results of the previous project (HIROSS4ALL), the project advances the replication of the Opengela one-stop shops to support citizens in neighborhood renovation processes, as well as establishing a stable technical and organizational model that will endure beyond the project.	

14	GBCE-14	"Construye 2030" PROJECT

Who?	What is it?	
Green Building Council España (GBCE)	Initiative to update the analysis of the current landscape of the construction sector and the proposals made in 2012 regarding training needs. Relaunch of the National Qualification Platform as a reference space for training issues.	Construye 2030
Relationship with INDICATE-Spain Partner INDICATE		
Other entities involved in the initiative Fundación Laboral de la Construcción Confederación Nacional de la Construcción (CNC) CCOO hábitat; UGT FICA; FUNDAE; IETcc-CSIC	https://gbce.es/proyectos/construye-2030/	
Where?	**Funding**	**When?**
Spain	Programme LIFE- BUILD UP Skills	2022-2024
How?	Analysis of the current training needs of the construction sector to contribute to the European climate goals for 2030. Based on the analysis, a Roadmap has been developed that includes priority measures targeting both university and non-university profiles, as well as an action plan for 2030 that identifies the necessary resources.	

15	GBCE-15	"LIFE LEVEL(S)" PROJECT

Who?	What is it?	
Green Building Council España (GBCE)	Initiative to promote sustainable buildings in Europe through increased awareness and the use of three specific Level(s) indicators: Life Cycle Assessment (LCA), Life Cycle Costing (LCC), and Indoor Air Quality (IAQ).	LIFE Level(s)
Relationship with INDICATE-Spain Partner INDICATE		
Other entities involved in the initiative Croatia GBC, Dutch GBC (DGBC), Alliance HQE-GBC, GBC Finland (FiGBC), GBC Italia, German Sustainable Building Council (DGNB) and Irish GBC (IGBC).	https://gbce.es/proyectos/life-levels/	
Where?	**Funding**	**When?**
Spain, Italy, Ireland, and Croatia	Programme LIFE	2019-2022
How?	It develops capacities, aligns the criteria of Green Public Procurement (GPP) with Level(s), and identifies the necessary requirements and data. The report "Standards and Recommendations for the Development of a National Database of Construction Materials" (Ecómetro) analyzes the quality and proper use of data for Spain. Cambridge Architectural Research (CAR) conducted a similar	

16	GBCE-16	MY DECARBONIZED DIPLOMA

Who?	What is it?	
Green Building Council España (GBCE)	Initiative to strengthen relationships with architecture, technical architecture, and engineering universities in Spain, aiming to engage students with current and future challenges in the professional world.	MI DIPLOMA DESCARBONIZADO
Relationship with INDICATE-Spain Partner INDICATE		
Other entities involved in the initiative Universidades: Internacional de Catalunya (UIC), Politécnica de Valencia (UPV), de Zaragoza (UNIZAR), Politécnica de Madrid (UPM), Pontificia Comillas (ICAI), de Sevilla (US), de Alcalá	https://gbce.es/proyectos	
Where?	**Funding**	**When?**
Spain		ANNUAL
How?	Students are provided with projects, knowledge, talks, events, training, and other activities from GBCE. Each school develops a work plan (approved by GBCE) carried out by a group of students throughout the academic year. The project is presented in June in person before a group of construction industry professionals.	

17	GBCE-17	"MAKING CITY" PROJECT

Who?	What is it?	
Green Building Council España (GBCE)	Its goal is to address and demonstrate the transformation of the urban energy system towards smart cities with low carbon emissions, based on the concept of Positive Energy Districts (PED).	
Relationship with INDICATE-Spain		
Partner INDICATE		
Other entities involved in the initiative		
CAR, TEC, GRO, TNO, GPO, SEV, WAM, NIJ, CGI, SB, RUG, HUAS, OUK, UOU, OEN, SIV, YIT, JET, ARI, VTT, BAS, UNI, LEO, KM, DEM, POP, RTU, VID, GSC, LUB, LGI, R2M, CAP	https://gbce.es/proyectos	
Where?	**Funding**	**When?**
Europa	Horizon 2020	2019-2024

How?	Demonstrating the concept of Positive Energy Districts (PED) in two lighthouse cities (Oulu and Groningen). Establishing a validated procedure to define the concept of PED. Replicating the concept in 6 cities. Supporting the City Vision 2050. Developing a rigorous monitoring and evaluation program. Determining business models that integrate the deployment of PEDs.

18	GBCE-18	"SMARTER4EU" PROJECT

Who?	What is it?	
Green Building Council España (GBCE)	Aims to provide technical support to financial entities in their evaluation of the sustainability of projects when granting loans.	
Relationship with INDICATE-Spain		
Socio INDICATE		
Other entities involved in the initiative		
RoGBC, IGBC, ENERSAVE capital, Temple media limited, EECU- Ukraine, ADENE, HFH- Nadacia Habitat for Humanity international, EUEA- Association European-ukrainian EA	https://gbce.es/proyectos/smarter4eu/	
Where?	**Funding**	**When?**
International	programme LIFE CET (Clean Energy Transition)	

How?	It focuses on mortgages, making them more affordable for citizens by offering lower interest rates due to the verification of the sustainability of the interventions. The goal is to implement a GMGH (Green Mortgages for Green Homes) scheme in the market that objectively evaluates the sustainability of homes, aligned with various frameworks, regulations, and European strategies.

19	GBCE-19	"AIRE" PROJECT

Who?	What is it?	
Green Building Council España (GBCE)	Initiative to develop a quality seal for the rehabilitation process. GBCE, working closely with the sector, will analyze the most significant milestones and processes in community rehabilitation to establish criteria, certifications, and a viable model of guaranteed quality.	
Relationship with INDICATE-Spain		
Socio INDICATE		
Other entities involved in the initiative		
GLOBAL NEW ENERGY FINANCE SL (GNE FINANCE), TRAMITECO SL, IMPALA PROJECTS SL (IMPALA)	https://gbce.es/proyectos	
Where?	**Funding**	**When?**
Spain		2024-2026

How?	Through the monitoring of two pilot projects, the difficulties that may arise in the rehabilitation process of a community will be identified for each of the involved stakeholders. Solutions will be provided through a work plan with milestones that will be certified to develop a viable, replicable, and trustworthy rehabilitation model, which will be awarded a quality seal by GBCe.

20	GBCE-20	"INFORME PAÍS" REPORT

Who?	What is it?	
Green Building Council España (GBCE)	Annual report that presents the reality of the sector in Spain, addressing the main urgencies from different levers for change and highlighting that to delve deeper into each of them, the lever of communication must be employed.	
Relationship with INDICATE-Spain		
Socio INDICATE		
Other entities involved in the initiative		
	https://gbce.es/tipo_recurso/informes/	
Where?	**Funding**	**When?**
Spain		ANNUAL

How?	Informe País 2021 GBCE: On the State of Sustainable Construction in Spain Informe País 2022 GBCE:On the State of Urgencies in Sustainable Construction in Spain Informe País 2023 GBCE: Biodiversity: Nature and Biodiversity in the Built Environment.

	UNIVERSITY OF SEVILLE			
21	US-1	"BIM-ZEN " CATALOGUE		
	Who?	**What is it?**		
	University of Seville - TEP 986	BIM Intelligent Design Support Catalogue for Building Envelopes with Zero Net Carbon Emissions in Spain (TED2021-129542B-I00)		
	Relationship with INDICATE-Spain	https://www.researchgate.net/lab/DATUS-Lab-Digital-Architecture-for-Sustainability-Lab-TEP-986-Carmen-Llatas		
	Partner INDICATE			
	Other entities involved in the initiative			
	Where?	**Funding**	**When?**	
	Formato PDF y plug-in en Revit	Plan Estatal (PEICTI) 2021	30/11/2024	
	How?	Catalogue of construction elements in BIM that allows for the simultaneous assessment of carbon footprint, costs, and social impacts of over 90,000 construction solutions for the envelopes of residential buildings. Funded by the call for Strategic Projects Aimed at Ecological Transition and Digital Transition, Call 2021.		
22	US-2	"DECIDE" TOOL		
	Who?	**What is it?**		
	University of Seville - TEP 986	Web Tool: "Design of Intelligent Circular and Decarbonized Buildings in Spain" (PID2022-137650OB-I00)		
	Relationship with INDICATE-Spain	https://www.researchgate.net/lab/DATUS-Lab-Digital-Architecture-for-		
	Partner INDICATE			
	Other entities involved in the initiative			
	Where?	**Funding**	**When?**	
	WEB	Plan Estatal (PEICTI) 2022	30/09/2027	
	How?	Digital tool based on AI for modeling and evaluating future decarbonization scenarios, integrating the evolution of carbon footprint, costs, social impacts, and circularity. Funded by the State Plan for Scientific and Technical Research and Innovation (PEICTI).		
23	US-3	IEA EBC ANNEX 89		
	Who?	**What is it?**		
	University of Seville - TEP 130 - TEP 986	Research project "Ways to Implement Net-Zero Whole Life Carbon Buildings"		
	Relationship with INDICATE-Spain	https://annex89.iea-ebc.org/		
	Partner INDICATE			
	Other entities involved in the initiative			
	IEA-EBC (International Energy Agency/ Energy in Buildings and Comunities Programme).			
	Multiple researchers			
	Where?	**Funding**	**When?**	
	Technical reports and scientific publications	Plan Estatal (PEICTI) 2022	2023-2027	
	How?	The project focuses on the pathways and measures that stakeholders and decision-makers need to implement net-zero greenhouse gas (GHG) emissions in buildings based on a whole life cycle approach in policy and practice. Funded by the State Plan for Scientific and Technical Research and Innovation (PEICTI).		
24	US-4	IEA EBC ANNEX 72		
	Who?	**What is it?**		
	University of Seville - TEP 130 - TEP 986	Research project focused on LCA methodology and life cycle carbon calculation throughout the building design process.		
	Relationship with INDICATE-Spain	https://annex72.iea-ebc.org/		
	Partner INDICATE			
	Other entities involved in the initiative			
	IEA-EBC (International Energy Agency/ Energy in Buildings and Comunities Programme).			
	Multiple researchers			
	Where?	**Funding**	**When?**	
	Technical reports and scientific publications	Plan Estatal (PEICTI) 2022	2016-2023	
	How?	The project has investigated harmonization issues arising when applying LCA approaches on buildings. It functions as a platform to exchange experiences and knowledge within partner countries and to foster the application of LCA on buildings in countries with little experience yet. The project has taken forward research already carried out under Annexes 56 and 57 of the EBC.		

ZERO CONSULTNG

25 ZCO-1 — NET ZERO TOOL

Who?	What is it?
Zero Consulting	Calculation and reduction tool for embedded and operational carbon (EPC) based on a single BIM model. Currently for internal use, it will be accessible to third parties in 2026.
Relationship with INDICATE-Spain: Methodology Validation / Data Contribution + BIM	https://blog.zeroconsulting.com/net-zero-lca-analisis-ciclo-vida
Other entities involved in the initiative	

Where?	Funding	When?
web tool	Funding in study	2022 - 2026

How? Centralized information on a single BIM model standardizes calculations, results, and tools while reducing time. The software for calculating embedded carbon (Net Zero LCA) has been developed and supports decision-making throughout the building design process. The development of energy simulations and EPCs will be completed by 2025.

METROPOLITAN AREA OF BARCELONA

26 AMB/ITeC-1 — SUSTAINABILITY PROTOCOL OF AMB-IMPSOL

Who?	What is it?
Metropolitan Area of Barcelona	Protocol that establishes the environmental criteria that projects and works contracted by AMB and IMPSOL must meet. It serves as a guide for constructing housing and public facilities and for carrying out urban interventions in streets, plazas, and parks that respect the environment.
Relationship with INDICATE-Spain: Methodology Validation / BIM Contribution	https://protocolsostenibilitat.amb.cat/
Other entities involved in the initiative: Instituto Metropolitano de Promoción de Suelo y Gestión Patrimonial (IMPSOL)	

Where?	Funding	When?
Área Metropiltana de Barcelona		From march 2020

How? Cross-cutting tool with a comprehensive vision that allows for the evaluation of the environmental impact of decisions made during the design and execution of projects. It includes alternative analyses and program optimization (sufficiency strategies) as well as limits on embedded carbon during the product and construction stages (A1-A3, A4, and A5). Finalist in the 2024 New European Bauhaus Awards.

ECÓMETRO

27 ECOMETRO 1 — ECÓMETRO LCA TOOL

Who?	What is it?
ECOMETRO MEDICIONES S.L.	Cloud-based LCA calculation tool
Relationship with INDICATE-Spain: Methodology Validation / Data Contribution	https://ecometro.es/es
Other entities involved in the initiative	

Where?	Funding	When?
Spain and South America	TRIODOS+SABADEL	From 2015

How? Life Cycle Assessment (LCA) calculation software for buildings based on the project's budget.

28 ECOMETRO 2 — COURSE "LCA IN CONSTRUCTION"

Who?	What is it?
ECOMETRO MEDICIONES S.L.	Online training course on the Ecómetro LCA tool.
Relationship with INDICATE-Spain: Methodology Validation / Data Contribution	https://formacion.ecometro.es
Other entities involved in the initiative	

Where?	Funding	When?
Spain		2024-2025

How? Course "Ecómetro LCA: Life Cycle Assessment in Construction," 20 hours long, covering context, policies, use of the ECOMETRO LCA TOOL, and case studies. This course addresses the context and tools available to the construction sector to tackle the decarbonisation processes that are impacting the industry.

29	ECOMETRO 3	ECF - GRANT 2023-2025

Who?	What is it?	
Ecómetro Association	Project to advocate for policy changes regarding the decarbonisation of architecture, with a particular focus on embedded carbon.	ecômetro
Relationship with INDICATE-Spain Methodology Validation / Data Contribution		
Other entities involved in the initiative European Climate Foundation	https://ecometro.es/es	
Where?	**Funding**	**When?**
Spain	European Climate Foundation (ECF)	2023-2025
How?	Annual project that includes several milestones throughout the year.	

30	ECOMETRO 4	TRANSLATION OF THE RAMBOLL REPORT

Who?	What is it?	
Ecómetro Association	Translation of the Ramboll report shared on the Ecómetro website (starting November 2024) "Life Cycle Carbon Models to Reduce Embedded Emissions from New Buildings in the EU27."	ecômetro
Relationship with INDICATE-Spain Methodology Validation / Data Contribution		
Other entities involved in the initiative	https://ecometro.es/es	
Where?	**Funding**	**When?**
Online publication	European Climate Foundation (ECF)	sep 2024
How?	Public presentation of the document translation and discussion on how the European context is translated to Spain, featuring the participation of the University of Seville, GBCE, and OneClickLCA. It is proposed to continue translating the Ramboll report and other relevant reports, aiming for one or two reports per year depending on available funding.	

31	ECOMETRO 5	CO2Nulo CERTIFICATION

Who?	What is it?	
Ecómetro Association	CO2Nulo, Zero tool label, the certification for projects in which the carbon footprint has been calculated, reduced and compensated, do not use fossil fuels and run on 100% renewable energy.	ecômetro
Relationship with INDICATE-Spain Methodology Validation / Data Contribution		
Other entities involved in the initiative Oficina de Cambio Climático CSIC	https://co2nulo.org/	
Where?	**Funding**	**When?**
Spain		From 2017
How?	Certification based on five steps: measure, minimize, offset, electrify, and achieve 100% renewables. Buildings: Cohousing ENTREPATIOS, Greenpeace Office, Triodos Bank Office, ShowPass Office, TRIPLE Coworking Office, PIRITA Cohousing Building, TOPETE Coliving Building, TOMÁS BRETÓN Building, vivio.land Housing Community, Casa Sophia Showroom.	

BALEARIC INSTITUTE OF HOUSING

32	IBAVI-1	ARV CATALOGUE. LOW ENVIRONMENTAL IMPACT BUILDING SOLUTIONS

Who?	What is it?	
Balearic Institute of Housing (IBAVI)	Web tool that compares low environmental impact construction solutions, preferably using local materials. It is part of the European ARV Project.	ARV
Relationship with INDICATE-Spain Methodology Validation / Data Contribution		
Other entities involved in the initiative Ajuntament de Palma de Mallorca Institut de Recerca en Energia de Catalunya (IREC)	https://greendeal-arv.eu/2022/02/14/spain/	
Where?	**Funding**	**When?**
Balears Islands	Programme H2020	2025. Under revision
How?	Through a dropdown menu, it allows users to select materials for a specific type of façade or roof, displaying: 1) kgCO2/m² (product stage A1-A3 of the LCA); 2) Thermal transmittance (energy improvement); 3) Circularity value according to Level(s); 4) Typical construction detail; 5) Image of a reference building where this construction solution has been applied.	

	INSTITUTE OF CONSTRUCTION TECHNOLOGY OF CATALONIA (ITeC)	
33	**ITEC-1**	**BEDEC BASE DATA**

Who?	What is it?	
Institute of Construction Technology of Catalonia	**"Structured Data Bank of Construction Elements" (FIEBC3) with reference prices and technical specifications from ITeC, entities, and manufacturers of construction products. It includes environmental information (CO2eq., water consumption, etc.).**	BEDEC ITeC
Relationship with INDICATE-Spain	https://itec.es/servicios/bedec/	
Methodology Validation / Data Contribution		
Other entities involved in the initiative		
Where?	**Funding**	**When?**
Spain		**From 1984**

How?	Online database of construction products to support the development of any phase of a project's life cycle. Updated to reflect technical, regulatory, and economic changes. It contains reference prices, environmental data (UNE-EN 15804), technical specifications, normative texts, BIM objects, company data, technical characteristics, certificates, and images.

34	**ITEC-2**	**SOFTWARE TCQi GMA**

Who?	What is it?	
Institute of Construction Technology of Catalonia	**LCA software. A module that allows for the analysis of the environmental impacts caused by construction materials and their implementation throughout the entire project life cycle, based on a budget (FIEBC3) with environmental data.**	TCQi GMA
Relationship with INDICATE-Spain	https://itec.es/programas/tcqi/gestion-ambiental/	
Methodology Validation / Data Contribution		
Other entities involved in the initiative		
Where?	**Funding**	**When?**
Spain		**From 1984**

How?	TCQi is software developed by ITeC for virtual construction, a Software-as-a-Service (SaaS) platform for the construction process. The GMA module calculates the CO2eq of the entire life cycle of the building, as well as the set of indicators according to UNE-EN 15978, enabling necessary measures to reduce its impact. Additionally, it allows for the preparation of documents for the management of construction and demolition waste (RCD).

35	**ITEC-3**	**"SIRCULAR" PROJECT**

Who?	What is it?	
Institute of Construction Technology of Catalonia	***"Sustainable and Integrated people centRiC solUtions for buiLding decArbonisation and circularity"*** **People-centered platform that will develop construction solutions and a set of digital tools.**	SIRCULAR
Relationship with INDICATE-Spain	https://itec.es/servicios/idi/proyectos/	
Methodology Validation / Data Contribution		
Other entities involved in the initiative		
22 socios		
Where?	**Funding**	**When?**
Europe	**Horizon Europe**	**2024-2027**

How?	Platform aimed at decarbonising existing buildings, prioritising the needs and well-being of individuals and communities. The goal is to make decarbonisation and circularity understandable and desirable for construction professionals and end users. Pilots are underway in Estonia, Spain, Greece, and Germany. LinkedIn: *@SIRCULAR Project / X channel: @SircularProject.*

36	**ITEC-4 /SO-9**	**"RECONSTRUCT" PROJECT**

Who?	What is it?	
ITeC / Societat Orgànica (AUS/COAC)	***"A Territorial Construction System for a Circular Low-Carbon Built Environment."*** **It will develop circular, eco-friendly, and innovative alternatives to ordinary Portland cement, integrating them with recycled biological materials in both in situ and prefabricated components.**	reconstruct
Relationship with INDICATE-Spain	https://reconstruct-project.eu/	
Methodology Validation / Data Contribution		
Other entities involved in the initiative		
ITEC (coordinador del proyecto) + 16 socios europeos de la industria, academia e investigación. Entre ellos: Simbiosy, Sorigué, Incasol, COMSA, CTCON...		
Where?	**Funding**	**When?**
Europa	**Horizon Europe**	**2023-2027**

How?	Two pilot projects in Barcelona and Brussels will establish stable regional supply chains for waste materials based on AI. This will be demonstrated through real-scale projects and regional clusters. ITeC will develop the Digital Product Passport, Construction Materials Passport, LCA, LCC, and alignment with LEVEL(S).

37	ITEC-5	"PLURAL" PROJECT

Who?	What is it?	
Instituto de Tecnología de la Construcción de Cataluña	*"Plug-and-use renovation with adaptable lightweight systems"* Project focused on creating "Plug-and-Use" kits for the rapid and energy-efficient rehabilitation of buildings.	PLURAL
Relationship with INDICATE-Spain	https://itec.es/infoitec/portfolio-items/proyecto-plural/	
Methodology Validation / Data Contribution		
Other entities involved in the initiative		
18 socios		
Where?	**Funding**	**When?**
Europa	Horizon 2020	2020-2024

How?	Cost-effective, eco-friendly, and flexible prefabricated "Plug-and-Use" kits are being developed for nearly zero-energy building renovations. These kits reduce energy use, renovation costs, and CO_2 emissions while enabling faster adaptation across all EU climates, ensuring minimal disruption to occupants.

38	ITEC-6	"RENHOMES" PROJECT

Who?	What is it?	
Instituto de Tecnología de la Construcción de Cataluña	Initiative to develop solutions and technologies for positive energy homes and residential districts. It addresses sustainable transition by reducing carbon emissions, resource scarcity, and energy poverty. The focus is on educating and engaging stakeholders.	REN+HOMES
Relationship with INDICATE-Spain	https://itec.es/infoitec/portfolio-items/proyecto-renplushomes/	
Methodology Validation / Data Contribution		
Other entities involved in the initiative		
23 socios		
Where?	**Funding**	**When?**
Europa	Horizon European Union Innovation Actions	2023-2027

How?	It focuses on: 1) deploying widely available and affordable key technologies (KT); 2) developing highly reproducible technology packages (TP); 3) integrating software solutions to streamline processes. The goal is to develop 23 solutions: 9 hardware, 7 software, and 7 methodologies for more energy-efficient circular homes (CPEH).

COLLEGE OF ARCHITECTS OF CATALONIA (COAC) GROUP "ARCHITECTURE AND SUSTAINABILITY" (AuS)

39	COAC-1/ITEC-7	CO2 MEASUREMENT TOOL DURING THE BUILDING PERMIT PHASE

Who?	What is it?	
College of Architects of Catalonia(COAC)- ITeC	Automated CO2 calculation tool during the building permit phase, using information from the project's statistical data sheet. This tool is developed in collaboration with COAC and ITeC.	Col·legi d'Arquitectes de Catalunya
Relationship with INDICATE-Spain	https://www.arquitectes.cat/ca/visat-i-registres	
Methodology Validation		
Other entities involved in the initiative		
Where?	**Funding**	**When?**
Catalonia		End of 2024

How?	When entering the statistical data sheet into the COAC's approval website, the tool calculates the CO2eq emissions index per square meter for the project, as well as the reference index based on building type and construction system. The data is approximate and aims to raise awareness and provide a sense of scale. It will be updated periodically.

40	AUS/COAC-2	"DECARBONIZING ARCHITECTURE" PROJECT

Who?	What is it?	
AuS Group - College of Architects of Catalonia(COAC)	Awareness and outreach project aimed at architects, featuring publications, videos, training activities, and educational initiatives about the need to decarbonize architecture and change how we design and construct our buildings.	DESCARBONITZANT L'ARQUITECTURA
Relationship with INDICATE-Spain	https://www.arquitectes.cat/ca/descarbonitzant-arquitectura	
Methodology Validation		
Other entities involved in the initiative		
CSCAE (Consejo superior de colegios de arq. de España) ACE-CAE (Consejo de arquitectos de Europa)		
Where?	**Funding**	**When?**
Catalonia		Continued

How?	Tools and resources are provided for the development of new competencies, along with outreach events that bring together key stakeholders in the sector. The third event (29/10/2024) focuses on the challenges of decarbonization for professional practice, aiming to be a key asset in the transition towards a carbon-neutral Europe by 2050.

41	AUS/COAC-3	WORKING GROUPS OF AuS (Architecture and Sustainability) - COAC

Who?	What is it?
AuS Group - College of Architects of Catalonia(COAC)	Six working groups for AuS (Architecture and Sustainability) members of COAC. Two groups are directly related to decarbonization: GT1 - Decarbonized Materials: earth, straw, cane, etc., and GT2 - Carbon Footprint of Materials (GT2 collaborates on INDICATE).
Relationship with INDICATE-Spain	
Methodology Validation	
Other entities involved in the initiative	

https://aus.arquitectes.cat/grups-de-treball/

Where?	Funding	When?
Catalonia		Continued

How?	Each working group conducts research, analysis, and sharing of findings to create a broader and more consolidated view of the current situation in their respective areas. The research will serve as a starting point for initiating projects that provide efficient solutions and act as tools to promote the values of the association.

42	AUS/SO-1	POSTGRADUATE COURSES - SERT SCHOOL (COAC)

Who?	What is it?
Societat Orgànica (AUS/COAC)	Postgraduate | Sustainable Architecture Hybrid theoretical-practical training (online + in-person) that addresses the new sustainability needs and demands of the construction sector (competitions, projects, construction, management). Directed by Societat Orgànica.
Relationship with INDICATE-Spain	
Methodology Validation	
Other entities involved in the initiative	
Escola Sert (COAC)	

https://www.escolasert.com/es/oferta-formativa/postgrado-arquitectura-

Where?	Funding	When?
Barcelona		Oct. 2024 (annual, biannual)

How?	The postgraduate program is organized into four modules of specific content: Module 1. Buildings with nearly zero consumption and emissions: vision, concepts, and criteria. Module 2. Tools and methods for assessment and improvement: nearly zero energy, water, materials, and waste. Module 3. Visits to reference projects and introduction to certification systems. Module 4. Practical project

43	AUS/SO-2	"ALIGRA" PROJECT

Who?	What is it?
Societat Orgànica (AUS/COAC)	Open-source prototype of dismantlable kits, the winning solution of the urban challenge "Regeneration of residential buildings with innovative sustainable systems." Fact sheet: *https://ajuntament.barcelona.cat/premsa/wp-content/uploads/2022/12/pdf_1.pdf*
Relationship with INDICATE-Spain	
Methodology Validation	
Other entities involved in the initiative	
Straddle3, Aiguasol, Tejido, Tall fusta.	
Solución ganadora del reto urbano «Regeneración de edificios c	

https://bithabitat.barcelona/es/proyectos/aligra/

Where?	Funding	When?
Barcelona. Open source prototype	IMU, BIT Habitat and Ajuntament BCN project com	2023-2024

How?	Integrated prefabricated construction system using 2D wood elements and derivatives. Kits include: (1) volume extension, (2) bioclimatic envelope improvement, (3) water tank, (4) PV modules, and (5) smart building. The system features multifunctional layers, modularity and standardization, ease of assembly and disassembly, lightweight construction, and eco-friendly, healthy materials for

44		

Who?	What is it?
Societat Orgànica (AUS/COAC)	Platform to promote reuse in the construction sector in Catalonia.
Relationship with INDICATE-Spain	
Methodology Validation	
Other entities involved in the initiative	
Holon, Solidança, Coòpolis, Arrevolt, La Constructiva, Lacol, Sostre Civic	

https://www.recircula.cat/

Where?	Funding	When?
Barcelona	Ajuntament de BCN "Impulsem el que fas" (parcial	2022-2024

How?	It is developed in two phases. Recircula I: identifies legislative, market, technological, and social barriers, proposes keys to overcoming them, and detects relevant initiatives. Recircula II: focuses on three prototypes, identifies stakeholders, and mechanisms for green public procurement. It aims to consolidate a network of agents to pool resources and provide essential services to enhance

45		
Who?	**What is it?**	
Societat Orgànica (AUS/COAC)	**This project promotes the use of natural ventilation to address thermal discomfort and air quality issues in public schools in Barcelona, which are increasingly concerning the educational community.**	ESCOLES + VENTILADES
Relationship with INDICATE-Spain		
Methodology Validation		
Other entities involved in the initiative		
UPC-ETSAV (liderado por Fabian López), Consorci d'Educació de Barcelona, ISGlobal, La Sembra	https://emv.upc.edu/	
Where?	**Funding**	**When?**
Catalonia	**Ajuntamnet Barcelona (Pla Clima 2023)**	
How?	It is divided into two phases: 1) Analyzing the comfort conditions of schools in Barcelona through energy simulations, focusing on the effects of natural ventilation during the summer months; 2) Implementing improvements in two pilot schools to test ventilation strategies, with results extracted for replication in other schools managed by the Consorci d'Educació.	

46	AUS/SO-5	COLLABORATION ON THE "DEGRASCPI-LCA" PROJECT
Who?	**What is it?**	
Societat Orgànica (AUS/COAC)	**External collaboration on the project "DEGRASCPI-LCA: Determining the Sustainability Level of Constructions and Industrial Processes through LCA"**	DEGRASCPI-LCA
Relationship with INDICATE-Spain		
Methodology Validation		
Other entities involved in the initiative		
Manteniment Sostenible Integral s.l., Smart City Cluster, IMMERSIA Data Visualization S.L, AFM	https://smartcitycluster.org/proyectos-2023/degrascpi-lca/	
Where?	**Funding**	**When?**
Catalonia	**Ministry's PRTR aid framework**	**2023-2024**
How?	Strategic consulting for developing a life cycle assessment (LCA) calculation tool within a BIM context. The process is carried out in phases, focusing on prioritized LCA stages and indicators.	

47	AUS/SO-6	MANUALS OF BIOCLIMATIC SPACES
Who?	**What is it?**	
Societat Orgànica (AUS/COAC)	**Collection on bioclimatic architecture aimed at construction professionals and technical personnel in administration, promoting efficiency and energy savings through passive architectural solutions. Available volumes: "Atriums" and "Gallery."**	
Relationship with INDICATE-Spain		
Methodology Validation		
Other entities involved in the initiative		
ICAEN, Generalitat de Catalunya	https://icaen.gencat.cat/es/l_icaen/publicacions/colleccio-arquitectura-bioclimatica/	
Where?	**Funding**	**When?**
Publication		**2023/2024 (multiple editions**
How?	Studies on bioclimatic solutions, based on experience and parameterized energy simulations. Structure: solution characterization, design criteria, presentations, regulations, performance, and best practices. Available volumes include: atriums, galleries, cross ventilation, solar chimneys, thermal inertia, and vegetation solutions.	

48	AUS/SO-7	"WIKIHOUSING" PROJECT
Who?	**What is it?**	
Societat Orgànica (AUS/COAC)	**Co-design, self-construction DIWO (Do It With Others), and monitoring of a prototype for affordable and sustainable housing for young people. An alternative solution for accessing public housing on vacant land, based on industrialized construction. Winning proposal of "The Proactive City 2021."**	WikiHousing Barcelona
Relationship with INDICATE-Spain		
Methodology Validation		
Other entities involved in the initiative		
Col. Atri (Straddle3, Idra, la Papiro,..), Mausa, Ateneus de fabricació, Tallfusta, Ariston, etc.	https://wikihousing.eu/bcn/es/inicio/	
Where?	**Funding**	**When?**
Barcelona. Open-source prototypes	**BIT Habitat and Ajuntament de Barcelona**	**2020-2024**
How?	Co-design, co-construction, and post-monitoring of 3 housing units with communal spaces, following theoretical and practical training for the collective. The construction process is based on reuse and the selection of low-impact and/or renewable materials, as well as light and dry prefabrication. A repository of solutions will be published as open source to enhance replicability.	

COLLEGE OF TECHNICAL ARCHITECTS OF BARCELONA (CATEB)

49	CATEB-1	MARKETcons WEB PORTAL

Who?	What is it?
College of Technical Architecture of Barcelona (CATEB)	Web portal designed as a meeting point for users to create, promote, and disseminate the reuse of construction products present in existing buildings.
Relationship with INDICATE-Spain Methodology Validation	https://csostenible.net/marketcons/about?locale=es
Other entities involved in the initiative Agencia de Residuos de Cataluña (ARC)	

Where?	Funding	When?
Catalonia / Spain	Waste Agency of Catalonia. Public subsidy 2018	2018-2020

How? The aim of MARKETcons is to promote the reuse of construction products to foster a circular economy model. It was developed by the Technical Architecture College of Barcelona, with the support of the Catalan Waste Agency (ARC). It was rated as the second-best project among the 78 applications submitted for ARC funding.

50	CATEB-2	PROGRAM OPERATOR OF EPDs DAPconstrucción®

Who?	What is it?
College of Technical Architecture of Barcelona (CATEB)	The organization manages a Type III Environmental Declaration program (EPD). DAPconstrucción® must meet a series of requirements in accordance with ISO 14025. This includes the registration and publication of EPDs, verification procedures, and the qualifications of verifiers, among others.
Relationship with INDICATE-Spain Methodology Validation	https://www.dapcons.com/login
Other entities involved in the initiative Miembro de ECO Platform	

Where?	Funding	When?
Catalonia / Spain		From 2008

How? As a result of a collaboration agreement in 2008 between the Directorate General for Building Quality and Housing Rehabilitation, the Directorate General for Environmental Quality and Climate Change (DMAV), and Cateb, this is Spain's first program operator for Environmental Product Declarations (EPDs). It was also the first to sign a bilateral agreement with the French operator

51	CATEB-3	AGREEMENT BETWEEN PROGRAM OPERATORS: DAPconstrucción® / INIES

Who?	What is it?
College of Technical Architecture of Barcelona (CATEB)	International mutual recognition agreement between DAPconstrucción® and INIES, aimed at creating partnerships and combining efforts between France and Spain to achieve decarbonization goals and reduce environmental impacts in the construction sector.
Relationship with INDICATE-Spain Methodology Validation	https://www.cateb.cat/dapconstruccion-i-inies-signen-un-acord-de-
Other entities involved in the initiative INIES (Francia)	

Where?	Funding	When?
Catalonia / Spain and France		2024

How? The DAPconstrucción® operator program from Cateb began the mutual recognition process with the INIES operator program, which manages Environmental Declarations in France and is administered by Alliance HQE-GBC. During this period, efforts have focused on establishing a common procedure for the verification and registration of DAPs in both operator programs.

UNIVERSITY OF THE BASQUE COUNTRY UPV/EHU "CAVIAR RESEARCH GROUP"

52	UPV/EHU-1	PARARENOVATE-LCT TOOL

Who?	What is it?
University of the Basque Country. CAVIAR Research Group	Parametric simulation tool aimed at the environmental and economic assessment of energy renovations with a life cycle approach.
Relationship with INDICATE-Spain Methodology Validation	https://caviarehu.eus/
Other entities involved in the initiative Departamento de Arquitectura UPV	https://doi.org/10.1016/j.enbuild.2024.114182

Where?	Funding	When?
WEB		2024

How? Automated tool based on Python scripts that evaluates renovation strategies for residential buildings using passive, active, or renewable energy interventions. It analyzes multiple scenarios based on five factors: 1) building type, 2) climate zone, 3) user behavior patterns, 4) economic scenario, and 5) building orientation.

INSTITUTE OF CONSTRUCTION OF CASTILE AND LEÓN (ICCL)

53 ICCL-1 — SUSTAINABLE CONSTRUCTION AWARDS OF CASTILE AND LEÓN

Who?	What is it?
Instituto de la construcción de Castilla y León (ICCL)	The X edition focuses on identifying, evaluating, and analyzing the contribution of buildings and infrastructures to the decarbonization process throughout their entire lifecycle.
Relationship with INDICATE-Spain	
Methodology Validation	
Other entities involved in the initiative	

https://premioconstruccionsostenible.es/

Where?	Funding	When?
State		November 2024

How? Over 20 years (2004-2024) and after 827 proposals and 159 awards, these biennial prizes serve as a benchmark recognizing projects and buildings that provide notable responses in terms of environmental, social, and economic sustainability as well as architectural quality. Each edition emphasizes a different aspect of sustainability.

54 ICCL-2 — ITE + 3R CONGRESS

Who?	What is it?
Instituto de la construcción de Castilla y León (ICCL)	VI Congress "Transforming Cities and Territories" gathers top-level experts and showcases exemplary projects and initiatives to explore the keys to the future of rehabilitation.
Relationship with INDICATE-Spain	
Methodology Validation	
Other entities involved in the initiative	

https://www.congresoitemas3r.com/

Where?	Funding	When?
Castilla y León (VI Congress in Segovia)		28-29 October 2024

How? With 180 speakers and 2,000 attendees over five editions, the congress has facilitated reflection and debate on the transformation of cities and territories, driven by the interplay of political and economic strategies, social dynamics, and technological innovations. The VI edition focuses on rehabilitation, public funding programs, and the impact of new regulatory developments.

VALENCIAN BUILDING INSTITUTE (IVE)

55 IVE-1 — WEB TOOL TURIA

Who?	What is it?
Instituto Valenciano de la Edificación (IVE)	"Toxicidad, Uso de los recursos e Impacto Ambiental" (Toxicity, Resource Use, and Web tool for assessing building and civil engineering projects. It generates an Environmental Assessment Report detailing the impact per square meter on key environmental indicators.
Relationship with INDICATE-Spain	
Methodology Validation	
Other entities involved in the initiative	

https://www.five.es/turia/

Where?	Funding	When?
WEB		From 2024

How? It is an instrument for administrations to include and assess environmental criteria in public tenders. It is a tool to help designers to choose the options with the lowest environmental impact. The environmental information provided by TURIA covers the product (A1-A3) and construction (A4-A5) stages of a project's life cycle.

	One Click LCA	
56	**OCLA-1**	**SOFTWARE AND TRAINING PLATFORM One Click LCA**
Who?	**What is it?**	
OneClick LCA	An initiative aimed at training 1 million professionals in decarbonization by 2030 at no cost. AI-based LCA and EPD software that incorporates global data.	
Relationship with INDICATE-Spain		
Methodology Validation		
Other entities involved in the initiative		
	https://academy.oneclicklca.com/	
Where?	**Funding**	**When?**
International (online)		2023 a 2030
How?	Through the One Click LCA Academy platform, free training is offered in multiple languages for construction professionals, focusing on decarbonization and low-emission building. The goal is to address the skills gap in sustainability within the industry.	
	CYPE	
57	**Cype-1**	**CYPE SOFTWARE**
Who?	**What is it?**	
Cype	Software tool that calculates the environmental impact generated by the construction of a building, from the extraction of raw materials to the completion of the construction process.	
Relationship with INDICATE-Spain		
Methodology Validation		
Other entities involved in the initiative		
	https://info.cype.com/es/tema/analisis-del-ciclo-de-vida/	
Where?	**Funding**	**When?**
Spain		Continued
How?	CYPE offers BIM solutions for professionals across various fields. The Life Cycle Analysis module is part of the Budget Generators and Arquímedes tools.	
	ENERGREEN DESIGN	
58	**ENERGEEN-1**	**CARBONLINE TOOL**
Who?	**What is it?**	
Energreen Design	A free and user-friendly tool designed for the early stages of a project, allowing for quick calculations of a building's carbon footprint throughout its life cycle. It is aligned with the European framework Level(s).	
Relationship with INDICATE-Spain		
Data Contribution		
Other entities involved in the initiative		
	https://www.energreendesign.com/carbonline/	
Where?	**Funding**	**When?**
WEB		2023
How?	Users input the quantity of each main element (facades, floors, etc.) and select the construction system to obtain the associated CO2eq emissions for the building over 50 years. Designers can compare different construction systems in terms of environmental impact, enabling more informed and responsible decision-making.	

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GBCE (Green Building Council España, or Council for Sustainable Building in Spain) is the leading organization for sustainable building in our country. Established in 2008, we are the reference point for the transformation towards a sustainable model in the building sector. We are part of a broad, growing, and diverse global network, present in over 75 countries and with 46,000 members representing the entire value chain: World Green Building Council, WorldGBC. Together with our partners, we train, certify, and facilitate connections to accelerate the transformation towards sustainability in our built environment.

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The University of Seville (US), founded in 1505, is an institution with a long history in teaching, research, and innovation, being an academic reference in Spain. Committed to sustainable development, the US promotes projects and collaborations that foster knowledge and provide solutions to current social and environmental challenges.