



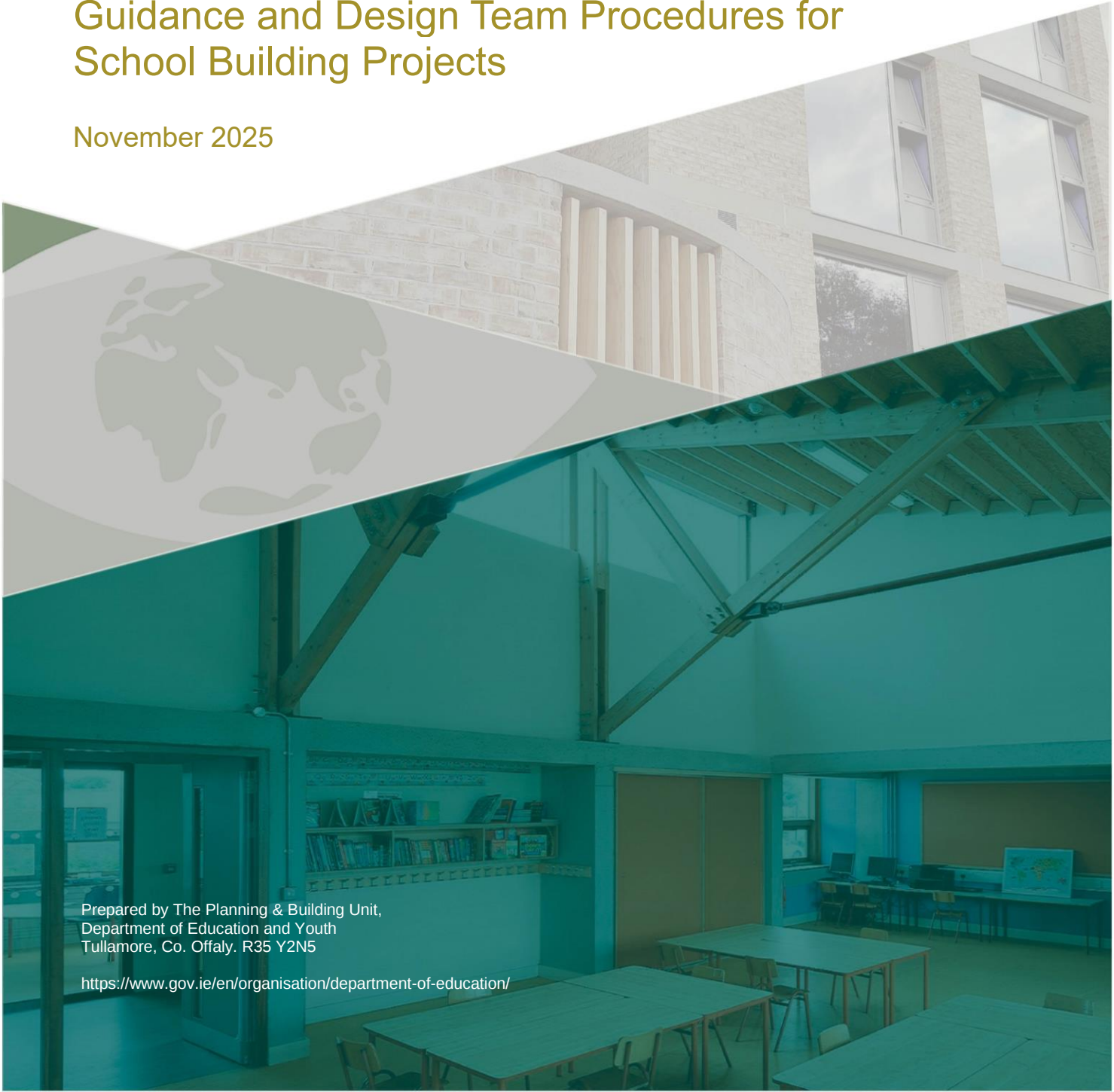
An Roinn Oideachais
agus Óige
Department of Education
and Youth

SDG 01-20

Life-Cycle Global Warming Potential (GWP)
Assessment Methodology
and the Principles of Low Carbon Design

Guidance and Design Team Procedures for
School Building Projects

November 2025



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<https://www.gov.ie/en/organisation/departments-of-education/>

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Glossary of Terms & Definitions

Assessor: Qualified professional who is authorized to evaluate and report the Life-Cycle GWP emissions of buildings. This individual must possess the necessary credentials and training to apply this methodology accurately, ensuring compliance with the EPBD 2024 and relevant national standards.

Biogenic Carbon: Carbon removals associated with carbon sequestration into biomass, as well as any emissions associated with this sequestered carbon.

Carbon dioxide (CO₂): A compound of carbon and oxygen produced by burning carbon and organic compounds and by respiration. Carbon dioxide is one of the main greenhouse gases.

Carbon dioxide equivalent (CO₂eq): is a metric measure used to compare the emissions from various greenhouse gases on the basis of their global-warming potential (GWP), by converting amounts of other gases to the equivalent amount of carbon dioxide with the same global warming potential.

Carbon sequestration: is a technique used for long-term capture and storage of carbon dioxide and other forms of carbon to mitigate global warming. This includes natural methods such as planting trees and soft landscaping to absorb carbon dioxide.

Embodied Carbon: refers to the emissions associated with materials and construction processes throughout the whole lifecycle of a building or infrastructure. This is typically associated with any processes, materials or products used to construct, maintain, repair, refurbish and repurpose a building (modules A1–A5, B1–B5, C1–C4).

Energy Performance of Buildings Directive (EPBD): Aiming to achieve a fully decarbonised building stock by 2050, the revised Energy Performance of Buildings Directive contributes directly to the EU's energy and climate goals. The objective of the directive is to promote and mandate the adoption of low-carbon materials and renewable energy solutions within buildings across the continent.

Environmental Product Declarations (EPDs): are a standardised way of providing data about the environmental impacts of a product through the product life cycle. They must conform to the European Standard, EN 15804, which ensures that EPD for construction products use a common methodology, report a common set of environmental indicators and have a common reporting format.

EU Level(s): The European Union assessment and reporting framework that provides a common language for sustainability performance of buildings.

Global Warming Potential (GWP): Measure of how much heat a greenhouse gas traps in the atmosphere over a specific time period, relative to carbon dioxide (CO₂). It is expressed as a multiple of warming caused by the same mass of carbon dioxide (CO₂).

Greenhouse gases (GHGs): are gases in Earth's atmosphere that absorb and emit heat, trapping it and warming the planet through a process called the greenhouse effect. The main GHGs are carbon dioxide (CO₂) and methane.

International Cost Management Standard (ICMS): A principles-based international standard that sets out how to classify, define, measure, record, analyse, present and compare construction project life cycle costs and carbon emissions in a structured and logical format.

Life-cycle Assessment (LCA): Methodology for assessing environmental impacts associated with all the stages of the life cycle of a commercial product, process, or service.

Life-Cycle Global Warming Potential (GWP): also referred to as Whole Life Carbon (WLC) is an indicator which quantifies the global warming potential of a building caused by carbon emissions along its full life cycle. WLC emissions are the carbon emissions resulting from materials, construction and use over a building's entire life, including demolition and disposal. This includes both Operational and Embodied carbon emissions.

Nearly zero energy building (NZEB): are buildings with a very high energy performance. The nearly zero or very low amount of energy required should be covered to a very significant extent by energy from renewable sources, including energy from renewable sources produced on-site or nearby.

Net zero: is the point where greenhouse gas emissions released into the atmosphere are balanced by removals. This is achieved by drastically reducing emissions, primarily by moving away from fossil fuels, and then counteracting any remaining emissions through activities like planting trees or using technology to remove CO₂ from the air.

Operational Carbon: the emissions associated with energy used to operate the building, including heating, hot water, cooling, ventilation, lighting systems and mechanical and electrical equipment.

Shadow Carbon: is used to put a monetary value on the impact of a change in carbon emissions when carrying out economic analysis. It captures the cost to society that arises from carbon emissions and is used in calculations to monetise the benefit of reducing carbon emissions, or an equivalent in other emissions.

Sustainability: defined as meeting the needs of the present without compromising the ability of future generations to meet their own needs.

Upfront Carbon: are GHG emissions associated with materials and construction processes up to practical completion (modules A0 –A5). Upfront carbon excludes the biogenic carbon sequestered in the installed products at practical completion.

Whole Life Carbon (WLC): refers to the total carbon emissions of a built asset throughout its entire life cycle, from the extraction of raw materials to its eventual demolition and disposal. It is the sum of embodied carbon (emissions from materials and construction) and operational carbon (emissions from use, such as heating, cooling, and lighting).

Abbreviated Terms

Abbreviation	Explanation
BEPM	Building Energy Performance Modelling
BIM	Building Information Modelling
CAP	Climate Action Plan
CEAP	Circular Economy Action Plan
CLT	Cross-Laminated Timber
CO ₂	Carbon dioxide
CO ₂ e/m ²	Carbon dioxide equivalent per square metre
CPR	Construction Products Regulation
CWMF	Capital Works Management Framework
DEY	Department of Education and Youth
DETE	Department of Enterprise, Tourism and Employment
DoHLGH	Department of Housing, Local Government and Heritage
DoP	Declaration of Performance
DPP	Digital Product Passports
DTP	Design Team Procedures
EPBD	Energy Performance of Buildings Directive
EPC	Energy Performance Certificate
EPD	Environmental Product Declaration
ESPR	Eco-design for Sustainable Products Regulation
GHG	Green House Gas
GPP	Green Public Procurement
GWP	Global Warming Potential
ICMS	International Cost Management Standard
IGBC	Irish Green Building Council
kgCO ₂ /yr	Kilograms of carbon dioxide per year
kWh/yr	Kilo Watt hour per year
LAWPRO	Local Authority Waters Programme
LCA	Life-Cycle Assessment
M&E	Mechanical and Electrical
MMC	Modern Methods of Construction
OGP	Office of Government Procurement
SEAI	Sustainable Energy Authority of Ireland
SDG	School Design Guidance
SDGs	Sustainable Development Goals
TGD	Technical Guidance Document
WLC	Whole Life Carbon

1.0 Introduction

- 1.1 This Guidance Document has been prepared by the Planning & Building Unit of the Department of Education and Youth to provide Guidance and Design Team Procedures relating to the **Life-Cycle Global Warming Potential (GWP) Assessment Methodology** for new school building projects.
- 1.2 This document has been prepared to align with the Life-Cycle Global Warming Potential (GWP) Calculation Methodology and Workbook published by the **Sustainable Energy Authority of Ireland (SEAI)** available at <https://www.seai.ie/EPBD/life-cycle-global-warming-potential-methodology>
- 1.3 This document also provides guidance on the principles of design which promote the reduction of embodied carbon in the construction of new school buildings, specifying low carbon construction methods and low carbon materials, as far as practicable.
- 1.4 This Guidance Document is to be read in conjunction with all other School Design Guidance (SDG) and Technical Guidance Documents (TGD) published by the Department of Education and Youth.
- 1.5 All references in this document to policies, regulations and standards shall be deemed to mean the current version. Links to other documents and website should be checked for any subsequent updates.
- 1.6 For further advice on these or any other matter, please contact:

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2.0 Application of this guidance

- 2.1 This Guidance and Design Team Procedure Document applies to all types of new school building projects (Primary, Post-Primary and Special Education Schools).
- 2.2 All new school building projects **commencing design** should include as a key design principle, the reduction of embodied carbon including the specification of low carbon construction methods and low carbon materials, **as far as practicable**.
- 2.3 A **Life-Cycle Global Warming Potential (GWP) Assessment**, in accordance with the Calculation Methodology as published by the **SEAI**, should be provided for all new school building projects in **excess of €10 million**, which are **commencing design**.
- 2.4 A **Life-Cycle Global Warming Potential (GWP) Assessment**, in accordance with the Calculation Methodology as published by the **SEAI**, should be provided for all new school building projects in **excess of €5 million**, which are commencing design from **1st September 2026**.

3.0 Background and Context

- 3.1 Climate change is the greatest environmental challenge of our time. Global warming due to human-generated greenhouse gas (GHG) emissions into the atmosphere, often referred to as carbon emissions, will have severe adverse environmental, biodiversity, social, and economic effects around the world if temperature levels continue to rise.
- 3.2 Our climate is changing rapidly. Human activity, primarily caused by greenhouse gas emissions consisting mostly of carbon dioxide (CO₂) and methane, has caused global surface average temperatures to rise by **1.1°C above 1850-1900 ('pre-industrial') levels**.
- 3.3 The science is unequivocal; continued greenhouse gas emissions will lead to increased global warming, which will intensify extreme weather events and other adverse impacts.
- 3.4 **The Paris Agreement** is a legally binding international treaty on climate change. It was adopted by 196 Parties at the UN Climate Change Conference (COP21) in Paris in 2015. The Paris Agreement and the **Sustainable Development Goals (SDGs)** recognise that the impacts of climate change will be felt by all, but that these impacts will be uneven.

SUSTAINABLE DEVELOPMENT GOALS



- 3.5 The overarching goal under **Climate Action** is to hold the increase in the global average temperature to well below 2°C above pre-industrial levels and pursue efforts to **limit the temperature increase to 1.5°C above pre-industrial levels** recognising that this would significantly reduce the risks and impacts of climate change.

3.6 The Irish Government's **Climate Action Plan** and **School Sector Climate Action Mandate** includes the requirements to decarbonize school buildings with the following targets:

- Reduce energy related greenhouse gas (GHG) emissions by **51% by 2030** against a baseline of 2016 to 2018 average emissions.
- Increase the improvement in energy efficiency from the 33% target in 2020 to **50% by 2030** against an agreed baseline.
- A **net zero energy** related emissions target for **2050** at the latest.

3.7 The **construction and built environment sectors** account for around **37% of Ireland's carbon emissions**. This 37% of emissions is made up of approximately **23% operational emissions** associated with the energy we use to heat, cool and light our buildings, with a further **14% of the emissions consisting of embodied carbon emissions** from the production and transport of construction materials, the construction process itself, and the maintenance, repair and disposal of buildings and infrastructure.

3.8 Under the Climate Action Plan, the **Sustainable Energy Authority of Ireland (SEAI)** are the lead on several actions that will improve transparency of the **embodied carbon** in buildings. These actions entail the development of a national database system comprising building (and other construction) materials, an official embodied carbon calculation methodology with associated software, and a resultant embodied carbon rating system for buildings.

3.9 **Life-Cycle Global Warming Potential (GWP)**, often referred to as **Whole Life Carbon (WLC)** is an indicator which quantifies the global warming potential of a building caused by carbon emissions along its full life cycle. **Whole Life-Cycle Carbon (WLC)** emissions are the carbon emissions resulting from materials, construction and use over a building's entire life, including demolition and disposal. This includes both **Operational** and **Embodied** carbon emissions. A Life-Cycle GWP or WLC Assessment provides a true picture of a building's carbon impact on the environment.

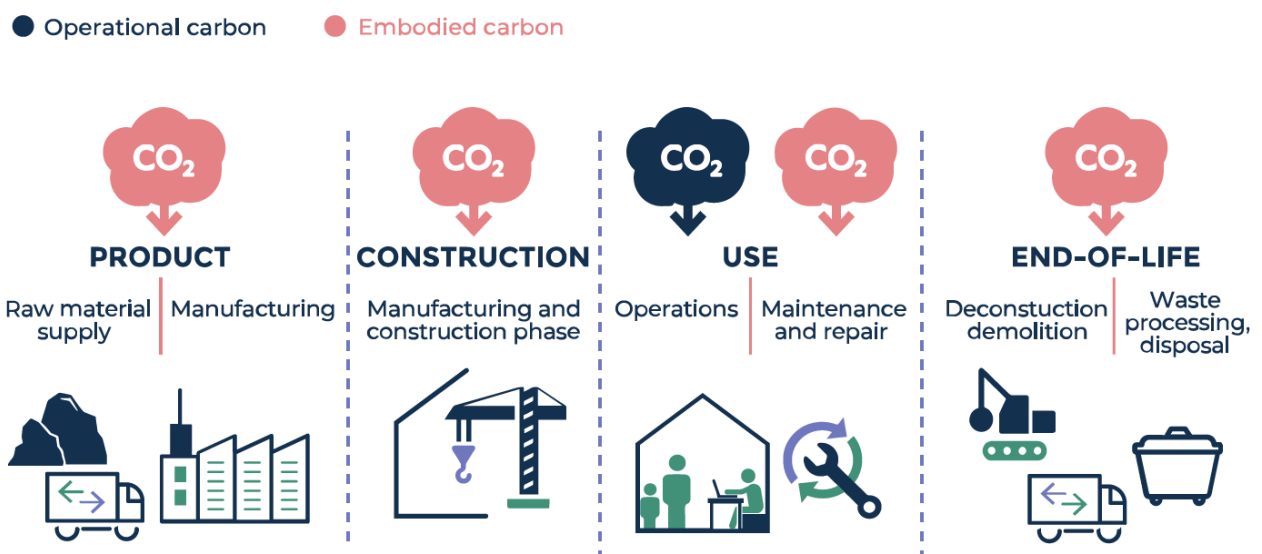


Figure 1: Illustrative breakdown of embodied and operational carbon in buildings. Source: BPIE

4.0 Policy Context

4.1 The European (EU) Green Deal

- 4.1.1 Published in December 2019, the **European (EU) Green Deal** established an action plan for moving to a clean, circular economy whilst restoring biodiversity, cutting pollution, and reaching climate neutrality **by 2050**.
- 4.1.2 The most relevant EU Green Deal policy initiatives to this guidance are the **‘Fit for 55’ package** and the **Circular Economy Action Plan**. Under the “Fit for 55” package of legislation, which aims to cut the Union’s carbon emission by **55% by 2030**, a revision to the Energy Performance of Buildings Directive (EPBD) was progressed and adopted in April 2024. Member States will have until **May 2026** to incorporate its requirements within national law.

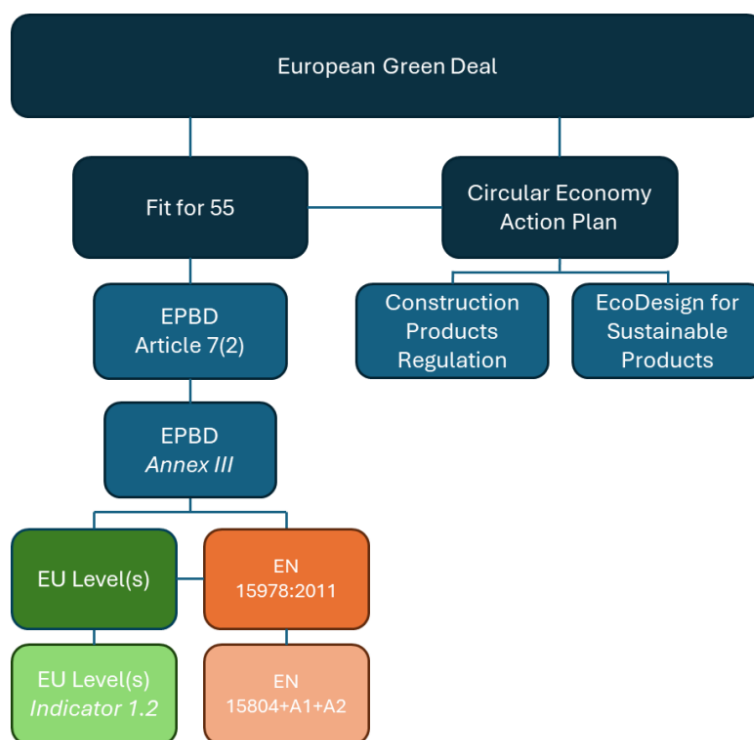


Figure 2: Guiding EU policies, frameworks and standards for compliance

4.2 The EU Energy Performance of Buildings Directive (EPBD)

- 4.2.1 The revised **EPBD** puts Europe on track to achieve a **fully decarbonised building stock by 2050**. By making zero-emission buildings the new standard for new buildings, it upgrades the existing regulatory framework (agreed in 2018) to reflect a higher climate ambition coupled with social action whilst providing Member States with the flexibility needed to account for the differences in the maturity and performance of building stock and industries across Europe.

- 4.2.2 The aim of the directive is to promote and mandate the adoption of **low-carbon materials** and **renewable energy solutions** within buildings across the continent. The directive provides a range of ambitious measures aimed at reducing energy emissions, both **operational emissions** and **embodied carbon emissions**, from buildings across the EU and requires governments to assess and limit all new buildings' emissions **from 2030**.
- 4.2.3 The calculation of **Life-Cycle GWP** for buildings pursuant to Article 7(2) is described in Annex III of the EPBD, where it notes that the data selection, scenario definition and calculations shall be carried out in accordance with **EN 15978**. It identifies further that the scope of building elements and technical equipment is as defined in the **Level(s) common EU framework for Indicator 1.2**.

4.3 The EU Level(s) Framework and Indicator 1.2

- 4.3.1 **The EU Level(s)** is a reporting framework designed to improve the sustainability of buildings. It is central to delivering the EU's overall ambition of **climate neutrality by 2050** as it provides a set of common indicators and metrics for measuring the environmental performance of office and residential buildings, considering their full life cycle.
- 4.3.2 As a common EU framework, it provides the main project actors (including project design teams; clients and investors; and public policy makers and procurers) with a common language to assess, compare, optimize, and report the sustainability of their buildings.
- 4.3.3 **The EU Level(s) Indicator 1.2** specifically focuses on GHG emissions and aims to quantify the GWP of a building along its lifecycle from 'cradle to grave'. It proposes to do so at 3 different stages:
- **Level 1. The conceptual design for the building project** – the simplest level as it entails early-stage qualitative assessments of the basis for the conceptual design and reporting on the concepts that have or are intended to be applied.
 - **Level 2. The detailed design and construction performance of the building** – an intermediate level as it entails the quantitative assessment of the designed performance and monitoring of the construction according to standardised units and methods.
 - **Level 3. The as-built and in-use performance** of how the building performs after completion and handover to the client – the most advanced level as it entails the monitoring and surveying of activity both on the construction site and of the completed building and its first occupants.
- 4.3.4 The unit of measurement used for the quantitative assessment of **Embodied Carbon Emissions** for buildings is Kg of CO₂ equivalents per m² of useful internal floor area (**KgCO₂eq/m²**) over a **reference period of 50 years**.
- 4.3.5 The basic principle is that the levels represent a design development from the initial concept through detail design, construction and then, after handover, to the reality of the completed building. Progression up the levels also represents an increase in the accuracy and reliability of the reporting.
- 4.3.6 The **EU Taxonomy** is a system that categorises economic activities deemed environmentally sustainable, providing a framework to determine how investments can be classified as sustainable. As Level(s) is a reporting framework which provides indicators to measure the environmental performance of buildings, it is a critical tool for implementing the EU Taxonomy.

4.4 I.S. EN 15978:2011 Sustainability of construction works - Assessment of environmental performance of buildings – Calculation method

- 4.4.1 This Irish Standard **I.S. EN 15978:2011** adopted from the European Standard document describes the calculation method, based on **Life Cycle Assessment (LCA)** and other quantified environmental information, to assess the environmental performance of a building, and gives the means for the reporting and communication of the outcome of the assessment.
- 4.4.2 The approach to the LCA assessment covers all stages of the building life cycle and is based on data obtained from **Environmental Product Declarations (EPD)**, their "information modules" (**EN 15804**) and other information necessary and relevant for carrying out the assessment. The assessment includes all building related construction products, processes and services, used over the life cycle of the building.
- 4.4.3 The standard includes a display of modular information for the different stages of the building assessment as shown below.

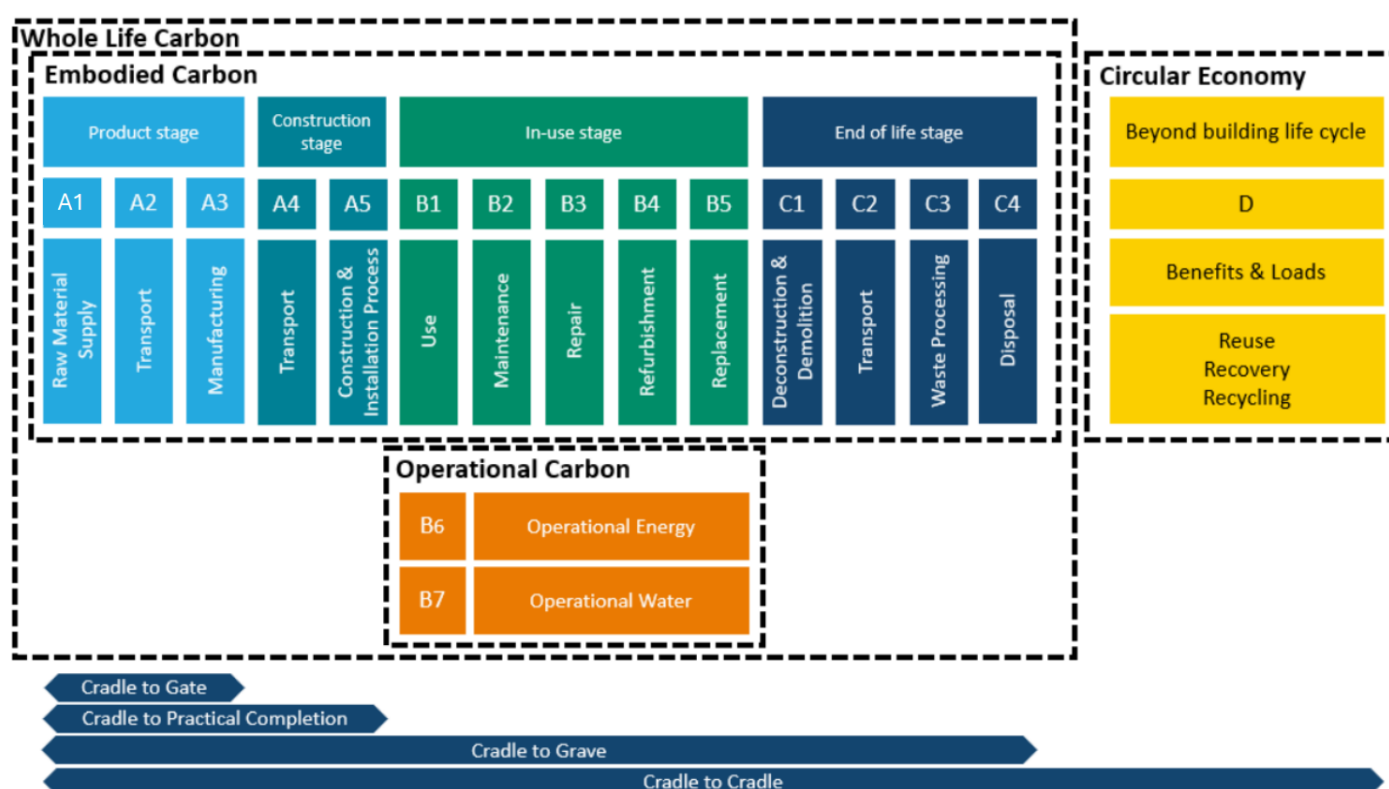


Figure 3: Building Life Cycle Stages as defined by EN 15978:2011

- 4.4.4 As illustrated above in I.S. EN 15978:2011, the **Embodied Carbon** refers to the greenhouse gas emissions associated with materials and construction processes defined as modules **A1 to A5** (product and construction), **B1 to B5** (in use) and **C1 to C4** (end of life). The **Operational Carbon** emissions are included in modules **B6 & B7**.

4.5 The Climate Action Plan 2025

- 4.5.1 **Climate Action Plan 2025** is the third annual update to Ireland's Climate Action Plan 2019 and the second to be prepared under the Climate Action and **Low Carbon Development (Amendment) Act 2021**. It builds on the introduction of carbon budgets and sectoral emissions ceilings in Climate Action Plan 2023 and sets a course for Ireland's targets to **halve emissions by 2030** and reach **net-zero no later than 2050**. These national targets align with Ireland's obligations under EU and international treaties, most notably the Paris Agreement (2015) and the European Green Deal (2020).

[Climate Action Plan](#)

- 4.5.2 The Climate Action Plan also sets targets for **reducing embodied carbon** in construction materials by at least **30% by 2030**. The Public Sector Climate Action Mandate requires the specification of low carbon construction methods and low carbon cement material as far as practicable for directly procured or supported construction projects from 2023.

4.6 The School Sector Climate Action Roadmap 2025-2030

- 4.6.1 The **School Sector Climate Action Roadmap 2025-2030** published by the Department of Education and Youth, provides an overview of the school sector requirements and roadmap to 2030 and towards 2050. It includes the strategic vision and outlines the high-level initial trajectory for the school sector delivery of its energy efficiency and greenhouse gas emission reduction targets.

[School Sector Climate Action Roadmap 2025-2030](#)

- 4.6.2 The roadmap document, states that all new school building projects commencing or at early design scope under the School Building Programme will develop and deliver **renewable heating to meet 90%** of annual heat load demand, supported by high efficiency mechanical ventilation heat recovery (MVHR) and cost optimum solar photovoltaic provision and electric vehicle charging.
- 4.6.3 The School Sector Climate Action Roadmap 2025-2030 mainly provides guidance on measures to reduce the **operational carbon emissions** which are included in Whole Life-Cycle Carbon assessments under modules B6 (energy use) & B7 (water use) of the I.S. EN 15978:2011 standard.
- 4.6.4 New school designs provided in accordance with the Department's Guidance have included:
- A3 Building Energy Rating (BER) standard since 2009.
 - 10% of primary energy provided via photovoltaics.
 - infrastructure provision for electric vehicle charging.
- 4.6.5 Additionally, the roadmap document provides guidance on the renewable heating schemes available for existing pre 2008 schools which will need extensive energy retrofits to align with the operational requirements of heat pump technology through the National Biomass and the National Heat Pump delivery programmes in order to achieve 2050 zero carbon targets.

5.0 Additional supporting Policies and Standards

5.1 The EU Circular Economy Action Plan (CEAP)

- 5.1.1 The European Commission adopted the new **Circular Economy Action Plan** in March 2020. It is one of the main building blocks of the European Green Deal. The new action plan announces initiatives along the entire life cycle of products. It targets how products are designed, promotes circular economy processes, encourages sustainable consumption, and aims to ensure that waste is prevented, and the resources used are kept in the EU economy for as long as possible.
- 5.1.2 The **Construction Products Regulation (CPR)** and the **Eco-design for Sustainable Products Regulation (ESPR)** are two measures within CEAP that have influence on how life cycle GWP of buildings will be calculated.

5.2 The Construction Products Regulation (CPR)

- 5.2.1 **The Construction Products Regulation (CPR)** is a pivotal EU legislation that sets standardized safety, performance, and environmental impact requirements for construction products across the EU.
- 5.2.2 Adopted by the European Council in November 2024 and published in EU's Official Journal in **December 2024**, the revised CPR has introduced several important measures that manufacturers must adhere to:
- **Digital Product Passports (DPP):** The DPP is a digital repository of a product's technical specifications and environmental data, facilitating compliance and traceability across the EU market.
 - **Enhanced CE marking:** CE marking now reflects both technical performance and environmental impact, ensuring products meet comprehensive safety and sustainability requirements.
 - **Environmental reporting standards:** CPR requires manufacturers to report on climate-related indicators, particularly CO2 emissions and energy usage, for priority construction products, with more indicators added gradually over the next few years.
- 5.2.3 The updated CPR requirements align with **EN 15804**, a European standard that establishes rules about creating **Environmental Product Declarations (EPDs)** for construction products and materials. EPDs provide transparent and comparable information about the life-cycle environmental impact of products within specific product categories.
- 5.2.4 CPR compliance requires an expanded **Declaration of Performance (DoP)**, which now includes environmental data in addition to traditional technical claims. The DoP acts as a comprehensive product dossier, detailing both performance and environmental standards that the product meets. This declaration is essential for regulatory authorities, as it ensures that all technical and environmental claims are verified and transparent.

5.3 International Cost Management Standards (ICMS 3) and Shadow Carbon

- 5.3.1 **International Cost Management Standard (ICMS) 3** is a global standard for consistent reporting of construction project costs and carbon emissions throughout the whole life cycle of a built asset. Mandated for use in Ireland since January 2024, ICMS 3 enables and allow decisions to be made on the basis of the total cost (both in terms of financial and carbon cost) of project construction and building ownership and operation – including the environmental impacts of decisions with respect to material selection, design and energy use and production.
- 5.3.2 ICMS 3 also acts as a classification system for building components, providing a clear and structured system for identifying and supporting calculation of carbon emissions across different construction and material components within a building project.
- 5.3.3 ICMS 3 also supports greater digitalisation within the construction industry by encouraging integration with digital tools such as **Building Information Modelling (BIM)**.
- 5.3.4 The **Shadow Price of Carbon** is used to put a monetary value on the impact of a change in carbon emissions when carrying out economic analysis.
- 5.3.5 The March 2024 release of the **Infrastructure Guidelines Supplementary Guidance on Measuring & Valuing Changes in Greenhouse Gas Emissions in Economic Appraisal** has updated the Shadow Price of Carbon Values.

5.4 Capital Works Management Framework (CWMF)

- 5.4.1 The **Office of Government Procurement (OGP)** have published on the **Capital Works Management Framework (CWMF)** website, new Cost Control and Carbon reporting templates, incorporating the International Cost Management Standards (ICMS3).
- 5.4.2 The templates are for use on all new capital works projects (commencing stage 1) from 1st January 2024. The CWMF website also includes guidance intended to help fill out the Cost and Carbon Templates.

5.5 Green Public Procurement

- 5.5.1 The **Green Public Procurement Strategy and Action Plan 2024-2027** aims to drive the implementation of green and circular procurement practices across the public sector.
[The Green Public Procurement Strategy & Action Plan 2024-2027](#)
- 5.5.2 Green Public Procurement (GPP) is defined as “a process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life cycle when compared to goods, services and works with the same primary function that would otherwise be procured”.
- 5.5.3 The GPP Strategy and Action Plan defines a number of actions in relation to the built environment including requirements for whole life cycle analysis to inform the design of building projects.

6.0 Life-Cycle GWP Calculation Methodology and Software Tools

6.1 The SEAI (Sustainable Energy Authority of Ireland)

- 6.1.1 The **SEAI (Sustainable Energy Authority of Ireland)** have published a national Methodology and Workbook for calculating the **Life-Cycle Global Warming Potential (GWP)** of buildings, as mandated by the recast Energy Performance of Buildings Directive (EPBD). This is available at <https://www.seai.ie/EPBD/life-cycle-global-warming-potential-methodology>
- 6.1.2 These documents set out SEAI's **technical methodology** for assessing GWP of buildings along their entire Life-Cycle. The definition of Life-Cycle is in accordance with **I.S. EN 15978:2011**. All **Life-Cycle stages (A, B, C, and D)** shall be included within the scope of the Life-Cycle GWP calculation. **Stage D** shall always be reported separately.
- 6.1.3 The SEAI **Life-Cycle GWP Calculation Methodology** requires that units be expressed as **kgCO₂eq/m² of useful floor area** over a reference study period of **50 years**.
- 6.1.4 These documents provide details of the requirements (mandatory and optional), and practical guidance on each Life-Cycle stage and module, in order to conduct a compliant Life-Cycle GWP Calculation. The detailed calculation methodologies are provided for each of the modules (as defined in I.S. EN 15978:2011) as follows:
- **A1-A3 Product Stages**
 - **A4-A5 Construction Stages**
 - **B1-B5 In-Use Stage** (Embodied Carbon Emissions)
 - **B6 In-Use Stage** (Operational Energy Carbon Emissions)
 - **C1-C4 End of Life Stage**
 - **D Benefits and loads beyond the system boundary Stage**
- 6.1.5 Since generic data values for Life-Cycle GWP calculations are required at the early design stage, SEAI is also in the process of creating Ireland's **National Embodied Carbon Database** of Building Materials.

6.2 Software Tools

- 6.2.1 There are a number of software tools available to assist in the calculation of Life-Cycle GWP. There is **no mandatory** use of a specific software tool, however any tool used should, as a minimum, meet the recommendations of the overarching Irish methodology and be compliant with **I.S. EN 15978:2011 and EU Level(s) Indicator 1.2**.
- 6.2.2 The software tool used should be reported in the submitted Life-Cycle GWP Assessment and the method used by the tool should clearly be described and verified.
- 6.2.3 The SEAI have published a Workbook which assists Assessors to calculate the Life-Cycle GWP for buildings in accordance with the requirements of the **SEAI calculation methodology**. The

assessment is based on carbon factors from Ireland's National embodied carbon Database of Building Materials and default scenarios, as outlined in the methodology.

7.0 Embodied Carbon Benchmarks and Targets

- 7.1 The Table 1 below provides details of **Embodied Carbon Benchmarks** for existing schools and proposed **Targets** for new school building projects.
- 7.2 The Targets indicated below are **not mandatory** at this stage, however Design Teams should demonstrate how the design of the school building project includes proposed measures for the reduction of Embodied Carbon and endeavours to achieve or potentially improve on the Targets **as far as practicable**.

Embodied Carbon Benchmarks & Targets for school buildings	Calculated in accordance with SEAI Life-Cycle GWP Methodology (For total of modules A1-A5, B1-B5 & C1-C4 as defined in I.S. EN 15978:2011)	Notes
Benchmark – existing schools	1000 kgCO ₂ e/m ²	Indicative embodied carbon benchmark for a typical existing school building constructed from 'traditional' type of materials including blockwork and pre-cast concrete based on RIAI 2030 Climate Challenge and other sources.
Current Target –new schools	<675 kgCO ₂ e/m ²	Design Teams should carry out a Life-Cycle GWP Assessment with Optioneering at each design stage to demonstrate how the design of the school building project and in particular the structural design and specification of materials and finishes, endeavours to achieve or potentially improve on this target as far as practicable .
2030 Target –new schools	<540 kgCO ₂ e/m ²	Design Teams should also consider how this improved 2030 Target could potentially be achieved for school building projects currently commencing design as far as practicable .

Table 1: Embodied Carbon Benchmarks and Targets

8.0 Principles of Low Carbon Design – Good Practice

8.1 General Principles

- 8.1.1 This document also provides guidance on the principles of design which promote the reduction of **embodied carbon** in the construction of new school buildings, specifying low carbon construction methods and low carbon materials, **as far as practicable**.
- 8.1.2 This aligns with Ireland's **Climate Action Plan 2025** which includes targets for **reducing embodied carbon** in construction materials by at least **30% by 2030**.
- 8.1.3 These Principles are a non-exhaustive list of '**Good Practice**' guidance for the design of new school building projects.
- 8.1.4 The design of low carbon school buildings should be approached in a '**holistic**' and co-ordinated manner with all members of the design team contributing and considering all of the design elements and criteria with **sustainability, functionality and value for money** integral to the process.
- 8.1.5 The design of new school projects, as well as being **sustainable**, should provide **inspiring and inclusive educational environments** to support the **wellbeing of students and staff** and facilitate our young people to reach their **full potential and feel valued**.



Image 1: Example of an inspiring and sustainable educational environment at Kishoge Community College, Lucan, Co. Dublin – McCullough Mulvin Architects – Photography by Ros Kavanagh

8.2 Design approach – site layout, building form and orientation

- 8.2.1 The proposed site layout and existing context should be considered at an early design stage, taking into account the potential for reduced carbon, by measures such as a review of existing ground conditions and topography to ensure the location of new structures reduces the extent of foundations and/or piling required and minimises any cut and fill on the site. Site Investigation and surveys should be carried out as early as possible in the design process to ensure the optimal structural design solution is achieved.
- 8.2.2 The school building's location on the site may also impact on the extent of access roadways and/or hard landscaping required depending on the proximity of existing infrastructure and utilities. Sites should be laid out to promote active travel including access to safe pedestrian and cycle routes as well as public transport where possible.
- 8.2.3 If the site includes existing buildings and infrastructure, consider at the start of the design stage the potential for re-use and retrofit subject to suitability for contemporary educational facilities and cost benefit analysis of measures such as energy and fabric upgrades.
- 8.2.4 The retention of existing structures and buildings if viable is the preferred option however if demolition is required then consideration should be given to re-cycling and re-use of materials in accordance with the principles of circularity.

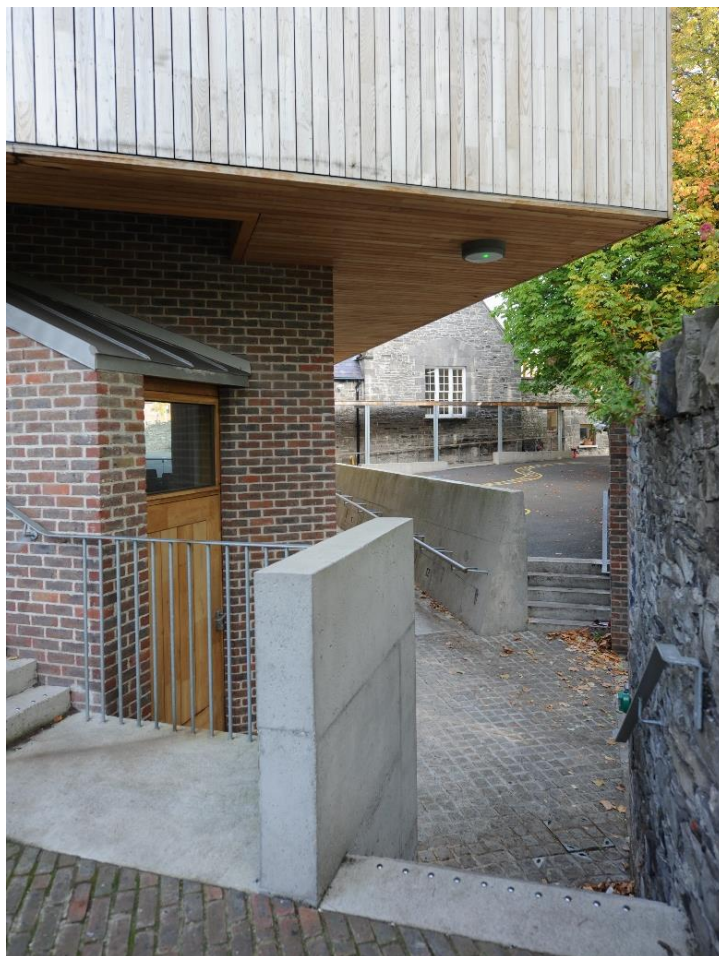


Image 2: Example of integration of existing and new buildings at the Model Primary School, Inchicore, Dublin – Donaghy + Dimond Architects

- 8.2.5 The orientation and site layout of new school buildings should be considered to maximise solar gain and natural daylight with teaching spaces prioritised on the east and south elevations. Specialist rooms that are at risk of overheating due to the functionality of the room should be prioritised on the northerly elevations, provided they do not require direct sunlight for teaching purposes.
- 8.2.6 Maximising controlled solar gain and daylight not only enhances comfort and wellbeing for students and staff, but also reduces heating and energy demand, thereby lowering operational carbon and contributing to long-term cost savings for the school.
- 8.2.7 Soft landscaping including areas of planting and trees should be included where possible on school site layouts to promote both biodiversity and student wellbeing as well as acting as carbon sequestration.
- 8.2.8 The external spaces and any existing natural features with the potential to support biodiversity or contribute to the carbon cycle should be considered as integral design assets, offering value through carbon sequestration, oxygen production, natural shelter and shade, habitat provision, sustainable drainage, and opportunities for outdoor learning.
- 8.2.9 Designers should consider Nature-based drainage solutions for school sites. This includes natural design solutions such as rain gardens, swales, bio retention systems and green & blue roofs. These systems contribute to carbon reduction, biodiversity and better environmental water quality. The Local Authority Waters Programme (LAWPRO) funded by the Department of Housing, Local Government and Heritage provides guidance on these types of systems.
- 8.2.10 Consider the building form early in the design process. The overall efficiency of the shape of a proposed new building, sometimes referred to as wall to floor ratio, is a key early determinate of overall carbon and resource efficiency. Complex external shapes require more material and offer more surface with which to gain or lose heat. Compact, efficient shapes are inherently more carbon efficient.
- 8.2.11 Multi storey structures where appropriate, reduce the footprint of the building resulting in a potential reduction of overall carbon emissions by optimizing land use, more efficient use of substructures and improving energy efficiency.



Image 3: Example of landscaped courtyard at St Mary's Secondary School, Ballina, Co Mayo – BDP Architects

8.3 Design approach – structural arrangement and systems

- 8.3.1 The **primary structure** (sub-structure & superstructure) typically account for approximately **50% of the embodied carbon** in a new building. Given the current predominance of concrete as the main structural building material in schools, it is clear that tackling concrete's carbon emissions can make a significant impact in reducing the overall embodied carbon of new school buildings.
- 8.3.2 The Department of Education and Youth have published a Design Guidance Technical Note **SDG 02-TN04 Low Carbon Concrete**. This guidance document provides an overview of design and specification considerations that may contribute to achieving the required reductions in embodied carbon associated with cement and concrete products used in school construction. [SDG 02-TN04](#)
- 8.3.3 The efficiency of the structural design can significantly reduce the embodied carbon in a new school building while also optimizing costs.
- 8.3.4 This includes early consideration of the structural grid and building layout to optimize loading conditions and efficiency of foundations. Other possible solutions include post-tensioned slabs and other structural systems. Vertical design loads to the building should be reviewed to ensure appropriate values are incorporated into the structural design. In some cases, standard live loads may be excessive and can be reduced.
- 8.3.5 Alternative structural systems and materials to reduce the embodied carbon such as using green steel, cross-laminated timber (CLT) or glulam framing for part or all of the building structure should be considered subject to viability based on all design criteria including availability and costs.
- 8.3.6 Structural elements that can be constructed off-site, such as pre-cast units or CLT panels can also achieve greater carbon efficiency due to factory-controlled construction conditions and reduction of waste.



Image 4: Example of glulam structure at St. Anne's Community College, Killaloe, Co. Clare – Thompson Architects

8.4 Design approach – materials and finishes

- 8.4.1 Materials and finishes with low carbon content should be specified both internally and externally for new school buildings where practicable.
- 8.4.2 All materials and finishes should also be appropriate for use in schools in terms of durability and compliance with all the performance criteria outlined including Building Regulations, Construction Products Regulations (CPR) and all Department of Education and Youth technical guidance performance requirements.
- 8.4.3 The long-term durability and life-cycle aspects of materials and finishes should be considered including how carbon emissions associated with maintenance and repair can be minimised. For example, durable external finishes such as brick and good quality roofing systems can reduce long term maintenance requirements as well as mitigate against the risk of defects, compared to lower quality and less sustainable products.
- 8.4.4 Consider minimising internal finishes such as the use of fair faced finished structures and a reduction in additional unnecessary linings where possible to reduce embodied carbon while also meeting all other performance and cost criteria.
- 8.4.5 Well considered and co-ordinated designs include simplicity of detailing for carbon and cost efficiency as well as less risk of defects such as roof leaks due to complex roof junctions and penetrations.
- 8.4.6 Regular grid layouts and repetitive formats such as standardised building component modules provide a more efficient use of materials and reduce waste.
- 8.4.7 Biogenic construction materials are building materials derived from renewable biological sources like trees and plants. They offer a sustainable alternative to conventional materials like concrete and steel, often with lower embodied carbon and the potential to sequester carbon.



Image 5: Example of partly exposed fair faced finishes including soffits, painted blockwork and surface mounted services at Harcourt Terrace Educate Together National School, Dublin 2 – Tún Architects

8.5 Design approach – M&E services: operational and embodied carbon

- 8.5.1 Designers should refer to the Department's technical and design guidance for mechanical and electrical services requirements in schools and the **School Sector Climate Action Roadmap 2024-2030** including the decarbonisation measures and **operational carbon** targets.
- 8.5.2 Mechanical and electrical plant and equipment contribute to typically **15-25% of the embodied carbon** in a school building but this can increase to approximately **70% for a retrofit project**.
- 8.5.3 This M&E plant which includes equipment such as boilers, heat pumps and MVHR units as well as ductwork and piping is of course essential for the operation of the school, however efficient and optimised design of these services can reduce embodied carbon and simplify maintenance whilst also achieving operational carbon targets.
- 8.5.4 There should be an integrated design approach that considers both embodied and operational carbon from the earliest design stage of the project.
- 8.5.5 In relation to **operational carbon**, it is proposed to integrate **Building Energy Performance Modelling (BEPM)** into the design procedures for all future new build and retrofit school projects. BEPM enables the design team to estimate and optimise a building's operational energy use at each design stage.
- 8.5.6 Under the existing design procedures for schools there is a requirement for overheating analysis, daylighting distribution analysis and production of a Building Regulations Part L compliance report. It is proposed to expand this dynamic simulation to provide the **Building Energy Performance Model (BEPM)** predicting actual energy use.
- 8.5.7 At this stage it is not proposed to set specific targets for **operational carbon**, however it is proposed that this should be reported in terms of **kgCO₂/yr** for each of the energy consuming systems in the school.
- 8.5.8 The M&E services in schools should be designed to minimise energy demand, use efficient systems and low carbon technologies.

8.6 Digital Design Tools

- 8.6.1 **Building Information Modelling (BIM)** is a process for creating and managing information on a construction project throughout its whole life cycle. It is a collaborative way of working, underpinned by the digital technologies which unlock more efficient methods of designing, creating and maintaining assets. Properly implemented, **BIM** delivers projects to a higher quality and safety level.
- 8.6.2 The **BIM** process and associated data structures are defined in the ISO 19650 and 12006 series of standards. Creating a digital Building Information Model enables those who interact with the building to optimize their choices, resulting in a greater whole life value for the asset.
- 8.6.3 The data handling capacity of **BIM** is a key digital design tool to accurately **measure** the **embodied carbon** in school building projects and optimise the potential carbon reduction measures.

8.7 Modern Methods of Construction

- 8.7.1 **Modern Methods of Construction (MMC)** is an industry term used to describe a range of manufacturing and innovative alternatives to traditional construction.

- 8.7.2 There are a number of categories of **MMC** which are generally classified as 'off-site' construction methods ranging from 3D (Volumetric) primary structural systems to 2D panelised systems, which involves assembling prefabricated walls and floors on site.
- 8.7.3 This also includes the pre-fabrication of building components such as pre-cast structural elements, timber frame, light steel gauge frame, cross-laminated timber (CLT) and glulam beams.
- 8.7.4 **MMC** helps to reduce manufacturing waste and energy, improves sustainability and circularity (most efficient use of materials) and reduces **embodied carbon**.
- 8.7.5 **MMC** also promotes precision through digitalisation and strict quality-control processes. Creating construction components and units using factory standard precision and consistency adds to the quality of structures improving performance and durability over the life-cycle of the project.

8.8 Circularity

- 8.8.1 **Circularity** or the **Circular Economy** is defined as one where the value of products, materials and resources is maintained in the economy at the highest possible value for as long as possible, and the generation of **waste minimised**, making an essential contribution to the EU's efforts to develop a sustainable, low carbon, resource efficient and competitive economy.
- 8.8.2 When applied to the built environment, **circularity** is defined as: 'The design, construction and demolition of a building in such a way that it incorporates not only the high-value use and **reuse of materials**, and an adaptive and futureproof design, but also ambitions for sustainability in relation to energy, water, biodiversity and ecosystems at the building and area level'.
- 8.8.3 One specific challenge in the transition to a circular economy is that the construction sector is highly complex. Its supply chains are fragmented and involve many parties with different purposes. It also relies heavily on subcontracting.
- 8.8.4 For new school building projects there should be an increased emphasis on the consideration of **Circularity** and the principles of the **Circular Economy**. This applies throughout the **design & construction** process including the potential for re-use of existing buildings, structures and materials, minimising waste and re-cycling construction materials **where practicable**.
- 8.8.5 The Irish Green Building Council (IGBC) have prepared a guidance document **Building a Circular Ireland roadmap (2025-2040)** which focuses on strategies for prevention and reuse, better design, and resource efficiency.



8.9 Assessment of other design criteria

- 8.9.1 Design Teams when developing designs for school building projects should, in addition to low carbon design measures, also consider and evaluate all other optimised design criteria including but not limited to:
- Costs
 - Impact on educational functionality
 - Availability & sources of materials
 - Programme implications
 - Buildability
 - Durability and maintenance
 - Reusability, Circularity and demolition v new build considerations
 - Impacts on Operational Carbon
 - Regulatory compliance (including Building Regulations, CPR and Fire Safety)
 - Health & safety
 - Compliance with other DEY Design & Technical Guidance
 - Acoustic performance
 - Thermal performance
 - Public procurement rules
 - Design & visual impacts
- 8.9.2 It is important that these other criteria are fully considered at the early stages of design to ensure that any proposed carbon reduction measures can be implemented without adverse impacts on the overall school design and construction process.
- 8.9.3 The optimised design should aim to achieve a reduced carbon impact as far as practicable whilst also addressing and complying with the requirements of the other design criteria.
- 8.9.4 In particular each proposed carbon reduction measure option should be costed to ensure optimal value is achieved whilst also endeavouring to comply with the embodied carbon targets.



Image 6: Example of exposed timber roof structure at Kilmallock Primary School– O'Donnell Tuomey Architects - Photography by Jed Niezgoda

9.0 Design Team Procedures – Design Stages

9.1 General

- 9.1.1 Design Teams must comply with all the requirements of the current **Design Team Procedures** published by the Department of Education and Youth and available on <https://www.gov.ie/en/organisation/departments-of-education/>
- 9.1.2 In addition to these Design Team Procedures the following additional scope of services is required to be carried out by the Design Team at each of the **Design Stages** relating to **Life-Cycle Global Warming Potential (GWP) Assessments** and the implementation of **Low carbon design measures** as far as practicable in the design of new school projects.
- 9.1.3 This additional scope of services in relation to the preparation of Life-Cycle Global Warming Potential (GWP) Assessments should be included for by Design Teams in their fee proposals for new appointments on school projects. Where appointments of Design Teams have been made prior to the introduction of this guidance, additional fees for this scope of services should be agreed with the Planning & Building Unit of the Department of Education and Youth based on the design stage status of specific school projects.

9.2 Stage 1 - Preliminary Design

- 9.2.1 **Stage 1 Preliminary Design** includes the assessment of site and location suitability and initial sketch design options.
- 9.2.2 A **Life-Cycle GWP ‘Qualitative’ Assessment** including the **embodied carbon** impact in accordance with **The EU Level(s) Indicator 1.2 Level 1** should be carried out for each of the initial sketch design options and the preferred option identified at Stage 1.
- 9.2.3 This **‘Qualitative’ Assessment** based on the conceptual design for the school project should also include high level/ preliminary quantities of the main structural elements which contribute to the majority of **embodied carbon** emissions.
- 9.2.4 The Design Team should carry out optioneering at this Preliminary Design Stage 1 to demonstrate how the design of the school building and in particular the structural design and specification of materials and finishes, **endeavours to achieve** or potentially improve on the targets for **embodied carbon** as noted in Section 7 of this document **as far as practicable**.
- 9.2.5 This includes potential retention and re-configuration of existing buildings if available on the site and suitable for the school project brief.
- 9.2.6 This preliminary design stage is critical in establishing the early fundamentals of the proposed design of the school project based on the **principles of low carbon design** as outlined above in Section 8 of this guidance document which promote the reduction of embodied carbon, specifying low carbon construction methods and low carbon materials, **as far as practicable**.
- 9.2.7 A preliminary **Building Energy Performance Model (BEPM)** should also be developed and used by the design team as a strategic design tool at Stage 1. Models should be developed for up to 3 sketch design options. The models should assess how massing, form-factor, orientation, glazing ratio, or shading strategies affect performance. The design team should consider the results of this preliminary Stage 1 BEPM when assessing the options. The total preliminary estimated annual

thermal and electrical energy (kWh/yr) and **operational carbon** (kgCO₂/yr) should be included in the Stage 1 Report.

- 9.2.8 The **Stage 1 Summary Report** should include the results of this **Life-Cycle GWP ‘Qualitative’ Assessment** including the **embodied carbon** impact and a description of the design optioneering carried out in accordance with the principles of low carbon design.

9.3 Stage 2a - Developed Design

- 9.3.1 **Stage 2a Developed Design** includes design development to a stage where the project is fully cost planned and can be prepared to lodge for statutory approvals.
- 9.3.2 **A Life-Cycle Global Warming Potential (GWP) Assessment**, in accordance with the **Calculation Methodology published by the SEAI**, should be carried out as part of the Stage 2a design development process based on a **‘Quantitative’ Assessment** of **embodied carbon** impact in accordance with **The EU Level(s) Indicator 1.2 Level 2**.
- 9.3.3 The EU Level(s) Indicator 1.2 Level 2 is based on the detailed design and construction performance of the building and defined as at an intermediate level as it entails the quantitative assessment of the designed performance according to standardised units and methods.
- 9.3.4 This ‘Quantitative’ Assessment of the embodied carbon impact at Stage 2a should be carried out for the design based on an approximate **Bill of Quantities** and **generic values** for embodied carbon content of proposed materials and finishes.
- 9.3.5 The Design Team should continue to detail and develop the options at this Developed Design Stage 2a to demonstrate how the design of the school building and in particular the structural design and specification of materials and finishes, **endeavours to achieve** or potentially improve on the targets for **embodied carbon** as noted in Section 7 of this document **as far as practicable**.
- 9.3.6 This Stage 2a Developed Design stage should also continue to detail and develop the options for the proposed design of the school project based on the **principles of low carbon design** as outlined above in Section 8 of this guidance document which promote the reduction of embodied carbon, specifying low carbon construction methods and low carbon materials, **as far as practicable**.
- 9.3.7 In particular the optimised primary structure and sub structure design should be detailed to a level where preliminary quantities can be measured to assess and potentially reduce the embodied carbon impacts of the structural design and materials.
- 9.3.8 A more detailed **Building Energy Performance Model (BEPM)** should also be developed at this stage based on the preferred option from Stage 1. The model should include geometry, weather file, zoning, thermal elements, thermal bridging, air tightness/infiltration, glazing, occupancy. Building services engineering systems should be based on Heating Ventilation and Air Conditioning (HVAC) templates. Overheating analysis, daylight distribution and Part L compliance check should be completed at this stage. On completion of these tasks, **dynamic modelling and simulation** should be completed to estimate the operational energy and carbon for the building. The following should be reported in the **Stage 2a Report**.

System - Thermal	Energy Consumption	Operational Carbon
Space Heating (fossil fuel)	kWh/yr	kgCO2/yr
Space Heating (electricity)	kWh/yr	kgCO2/yr
Space Cooling	kWh/yr	kgCO2/yr
Fans (including MVHR)	kWh/yr	kgCO2/yr
Pumps	kWh/yr	kgCO2/yr
Domestic Hot Water (fossil fuel)	kWh/yr	kgCO2/yr
Domestic Hot Water (electricity)	kWh/yr	kgCO2/yr
System - Electrical	Energy Consumption	Operational Carbon
Interior Lighting (including controls)	kWh/yr	kgCO2/yr
Exterior Lighting (including controls)	kWh/yr	kgCO2/yr
Catering (fossil fuel)	kWh/yr	kgCO2/yr
Catering (electricity)	kWh/yr	kgCO2/yr
Lifts	kWh/yr	kgCO2/yr
Unregulated equipment	kWh/yr	kgCO2/yr
Total	kWh/yr	kgCO2/yr

Table 2: Thermal and Electrical Systems to be reported on for operational energy and carbon

- 9.3.9 The **Stage 2a Report** should include the results of this **Life-Cycle Global Warming Potential (GWP) Assessment** including the **embodied carbon** impact and a description of the design optioneering carried out in accordance with the principles of low carbon design.

9.4 Stage 2b - Detailed Design

- 9.4.1 The Design Team objectives for **Stage 2b Detailed Design** are to obtain all statutory approvals, prepare a set of fully detailed Tender Documents and prepare an accurate pre-tender cost check.
- 9.4.2 A **Life-Cycle Global Warming Potential (GWP) Assessment**, in accordance with the **Calculation Methodology published by the SEAI**, should be carried out as part of the Stage 2b detailed design process based on a '**Quantitative**' **Assessment** of **embodied carbon** impact in accordance with **The EU Level(s) Indicator 1.2 Level 2**.

- 9.4.3 This 'Quantitative Assessment' of the embodied carbon impact at Stage 2b should be carried out for the detailed design based on a full **Bill of Quantities**.
- 9.4.4 This will include a fully detailed and measured primary structure and sub structure as well as the external envelope, materials and finishes to give an accurate assessment of the embodied carbon content of the school building design.
- 9.4.5 **Environmental Product Declarations (EPDs)** in accordance with **EN 15804** provide more accuracy to the Life-Cycle (GWP) Assessment at the detailed design stage. However as specific products cannot be specified in tender documents under public procurement rules, performance specification criteria should include low carbon materials **as far as practicable**.
- 9.4.6 The Design Team should finalise the Detailed Design at Stage 2b to demonstrate how the design of the school building and in particular the structural design and specification of materials and finishes, **endeavours to achieve** or potentially improve on the targets for **embodied carbon** as noted in Section 7 of this document **as far as practicable**.
- 9.4.7 The Stage 2b Detailed Design should also finalise the detailed design of the school project based on the **principles of low carbon design** as outlined above in Section 8 of this guidance document which promote the reduction of embodied carbon, specifying low carbon construction methods and low carbon materials, **as far as practicable**.
- 9.4.8 The Stage 2a **Building Energy Performance Model (BEPM)** should be refined at Detailed Design **Stage 2b**. All building services engineering systems, their properties and the controls should be represented as accurately as possible within the model and results in the same format as defined at Stage 2a should be included in the Stage 2b Report.
- 9.4.9 The **Stage 2b Report** should include the results of this **Life-Cycle Global Warming Potential (GWP) Assessment** including the **embodied carbon** impact and a description of the finalized design based on the optioneering carried out in accordance with the principles of low carbon design.
- 9.4.10 The Stage 2b **Life-Cycle Global Warming Potential (GWP) Assessment** should be included in the Tender Documentation for information with '**non-product specific**' values for carbon content of materials and finishes included.

9.5 Stage 3 - Tender Action

- 9.5.1 The Design Team Procedures for **Stage 3 -Tender Action** includes the issue of tenders, the evaluation of tender submissions, tender reporting and Contract Award.
- 9.5.2 The Design Team are responsible for ensuring that the project is fully designed, detailed and coordinated before going to tender and that all the information necessary to complete the construction is included in the Tender Documents.
- 9.5.3 Design Teams should familiarise themselves with the Green Public Procurement Strategy and Action Plan 2024-2027. It is intended that this will play a key role in driving the implementation of green and circular procurement practices across the public sector and on public sector building projects.
- 9.5.4 Design Teams should also consider the inclusion of low carbon measures proposed by tenderers as part of the evaluation of tenders as far as practicable.

9.6 Stage 4 - Construction

- 9.6.1 The **Life-Cycle Global Warming Potential (GWP) Assessment** provided for information as part of the Tender Documentation should be tracked by the Design Team during the **construction stage** and included in the Project Progress Reports with the actual values based on the **Environmental Product Declarations (EPDs)** for embodied carbon content of materials and finishes used in the construction of the school project.
- 9.6.2 **Environmental Product Declarations (EPDs)** in accordance with **EN 15804** should be provided by the Contractor where available as part of product submissions in accordance with the Building Contract.
- 9.6.3 The Design Team should monitor throughout the construction stage and liaise with the Contractor on sustainability and decarbonisation measures as far as practicable and subject to these not creating any cost variations to the Works Requirements.

9.7 Stage 5 - Handover

- 9.7.1 The 'As Built' **Life-Cycle Global Warming Potential (GWP) Assessment** should be provided by the Design Team to be included as part of the handover documentation based on the actual EPDs and materials and finishes data of the completed school building project.
- 9.7.2 This information can be formulated through the BIM model and Asset Information Requirements.



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