Integrating whole life carbon in policy decisions

20/07/2021 | Senta Schmatzberger

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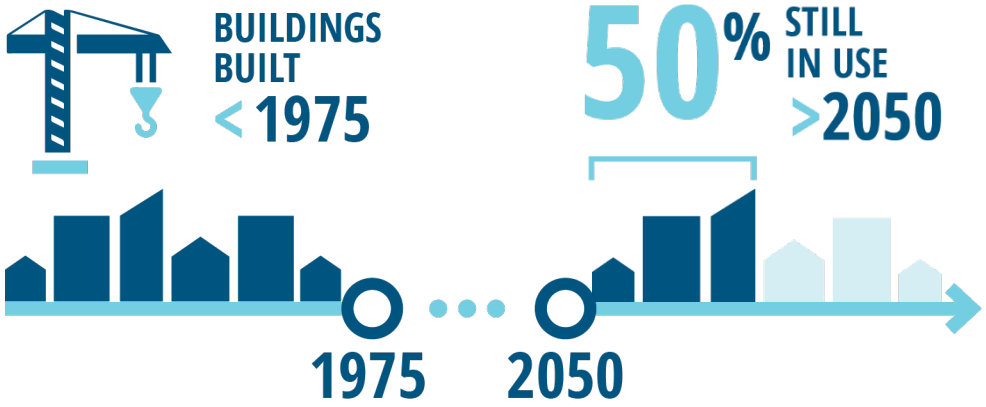
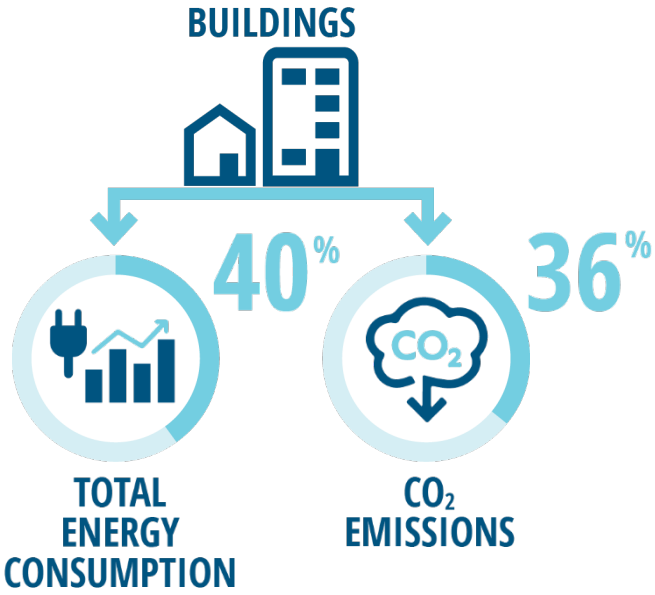
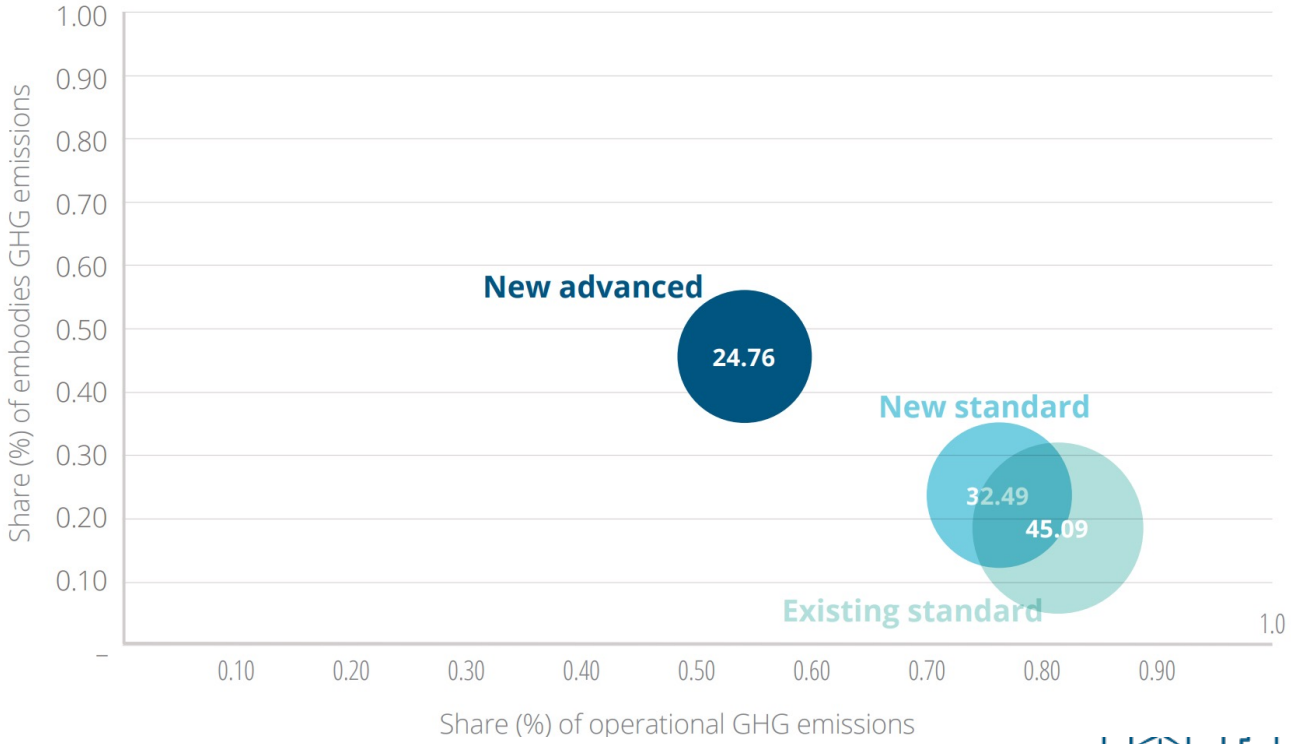
BPIE

European Buildings





Building regulations and WLC



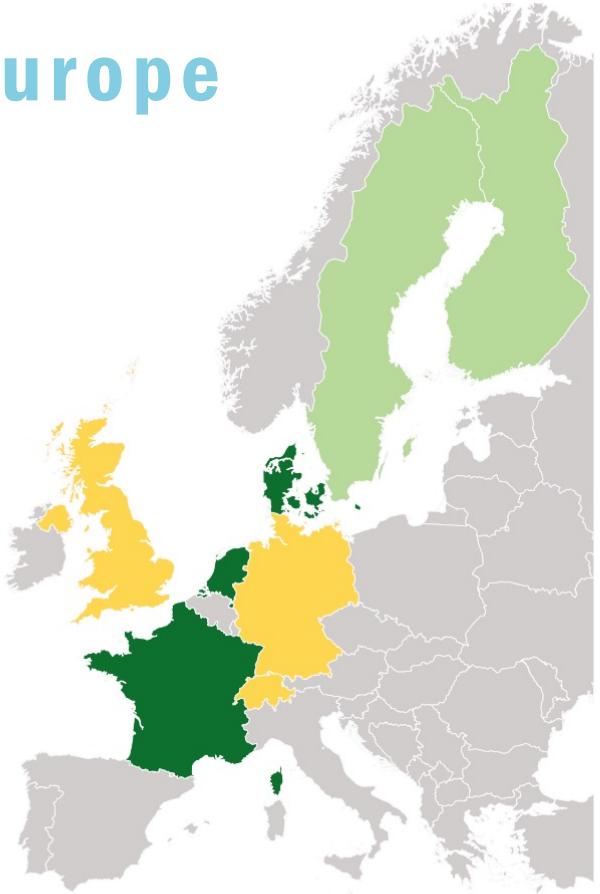
Current state of WLC regulation

Lifecycle stages	Modules	EU policy instruments							
		EPBD	EED	CPR[6]	Ecodesign	WFD[7]	ETS[8]	Level(s) [9]	Taxonomy[10]
PRODUCTION	A1 Raw material supply	-	-	(*)	•	-	•	••	(*)
	A2 Transport	-	-	-	-	-	(*)	••	(*)
	A3 Manufacturing	-	-	(*)	-	-	•	••	(*)
CONSTRUCTION	A4 Transport	-	-	-	-	-	(*)	••	(*)
	A5 Construction installation process	-	-	(*)	-	-	-	••	(*)
USE	B2 Maintenance	-	-	(*)	-	-	-	••	(*)
	B3 Repair	-	-	(*)	-	-	-	••	(*)
	B4 Replacement	-	-	(*)	-	-	-	••	(*)
	B5 Refurbishment	-	-	(*)	-	-	-	••	(*)
	B6 Operational energy use	••	••	-	•	-	(*)	••	••
END-OF-LIFE	C1 Deconstruction	-	-	(*)	-	•	-	••	(*)
	C2 Transport	-	-	-	-	-	(*)	••	(*)
	C3 Waste processing	-	-	-	-	••	-	••	(*)
	C4 Disposal	-	-	-	•	••	-	••	(*)
BEYOND LIFE	D Reuse/recycle	-	-	(*)	•	•	-	••	(*)

Partially covered Fully covered Under revision

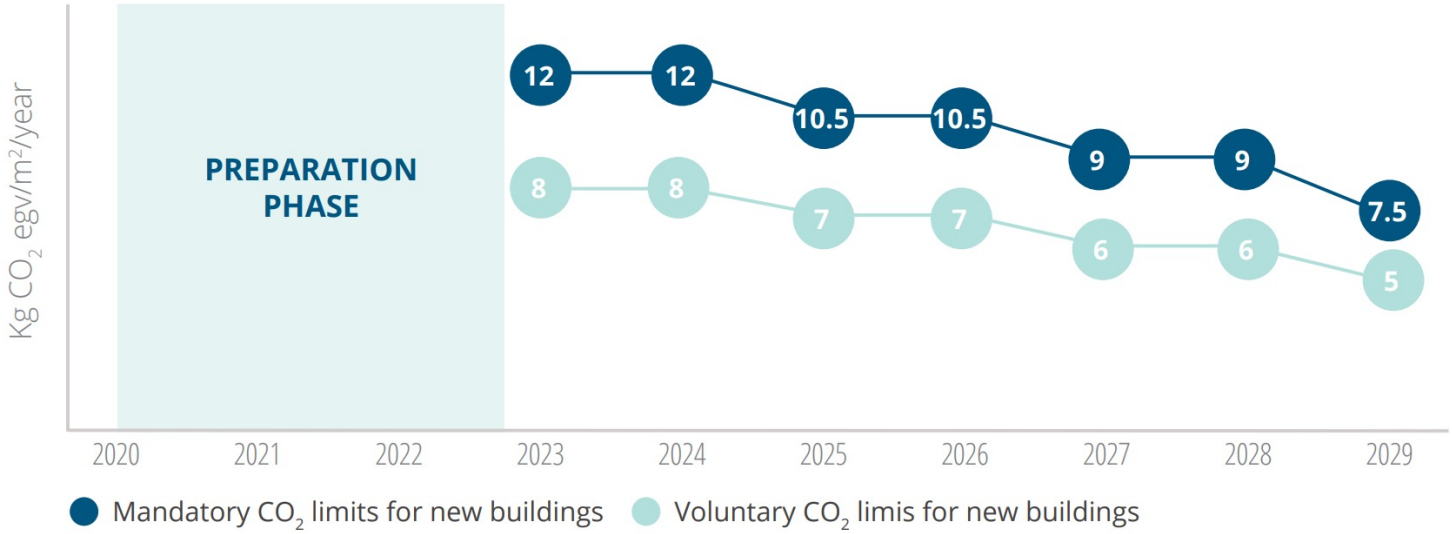
Examples from Europe

- WLC regulation for all/non-residential buildings implemented/agreed
- WLC regulation for all/non-residential buildings planned
- LCA reguirement for public buildings implemented/ agreed

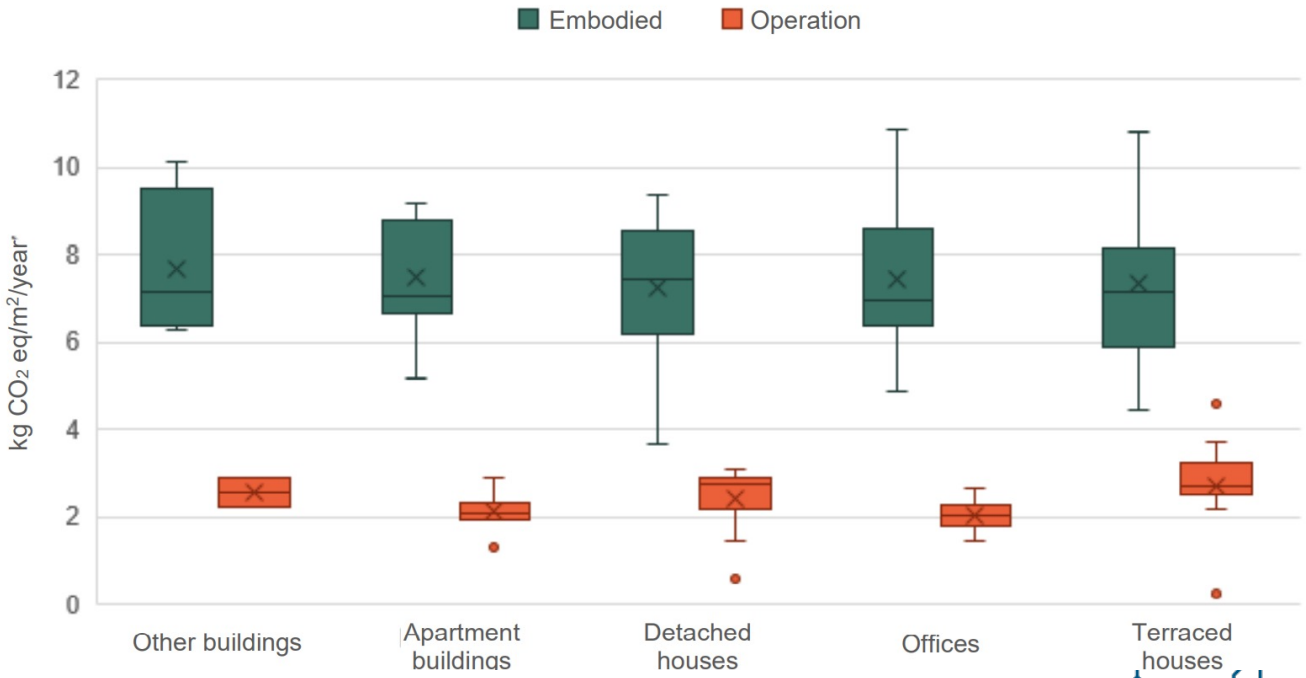


Example: WLC regulation in Denmark

Figure 3: Denmark regulates whole-life carbon from 2023 in their national building regulations. Information derived from the Danish agreement on sustainable construction [05/03/2020]. The carbon impact comprises both embodied and operational carbon emission based on LCA. Ministry of the Interior and Housing (2021) National strategy for sustainable construction (Available in Danish: Online).



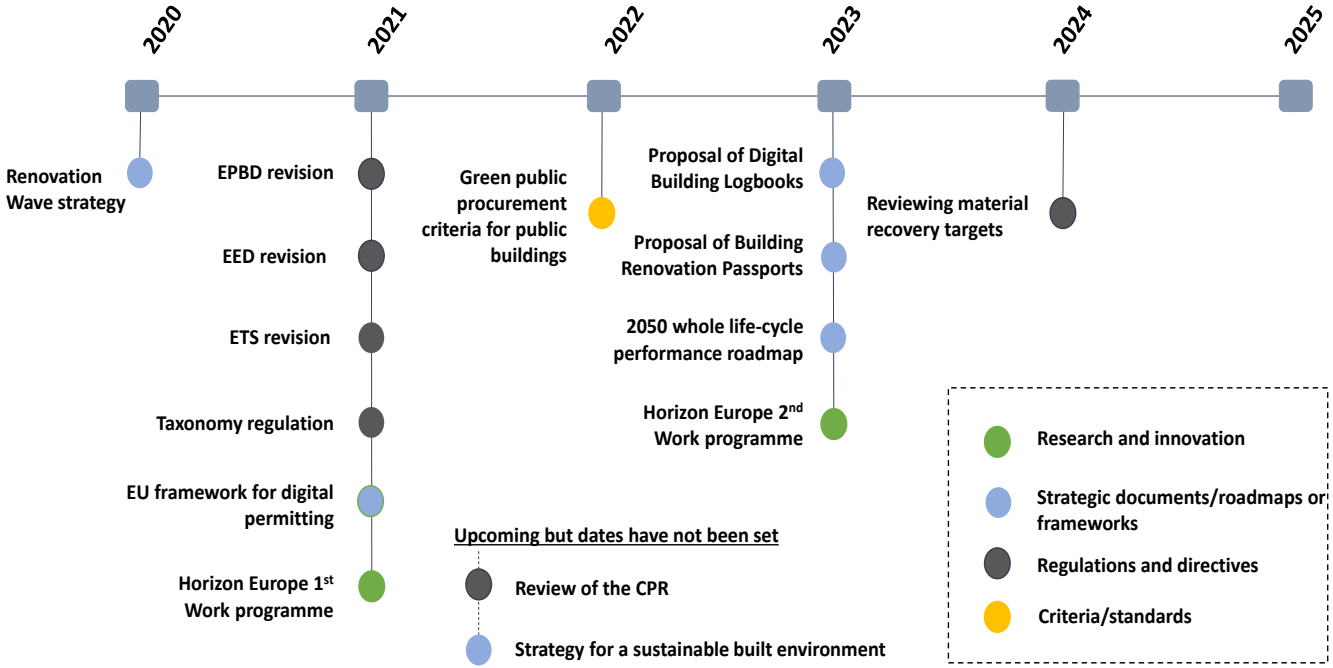
Example: WLC benchmarks in DK



Overview of potential policy intervention points

Policy levels	Policy target areas
Material and product level	• Introduce material passports and product certification to enable recovery and reuse • Roll out Environmental Product Declarations (EPDs) to improve data availability and quality of LCA results • Set requirements on embodied impacts and environmental sustainability • Improve enforceability and validation of in-use product performance
Building level	• Set carbon metrics and targets in addition to existing energy indicators • Define net zero carbon new buildings and renovations • Gradually require LCA and Life Cycle Costing (LCC), lead by example in public procurement • Encourage the use of BIM and building logbooks to improve the traceability of materials • Ensure WLC is considered in the mandatory minimum energy performance standards
Corporate & market level	• Introduce WLC reporting and disclosure requirements • Provide preferential financing and taxonomy eligibility

Policy timeline and anchors



POLICY OPTIONS

2021 - 2025

Prepare the ground for the introduction of WLC metrics

Adopt EU-wide methodology to assess embodied emissions, incl. detailed guidance with reference to widely accepted LCA standards

Introduce requirements for new buildings to report embodied carbon

Clear timeline for how embodied carbon limits for building types will be introduced, and collect data to inform benchmarks

2030

Upgrade (NZEB) definitions to net-zero carbon definitions,

Agree a method for setting carbon limiting values

2040

Continually review and lower embodied and operational carbon values.

Monitor and align thresholds with science-based targets and decarbonisation pathways for various build types and sectors

2050 Vision

The entire building stock will be net-zero carbon across the entire lifecycle

Resource efficiency, circularity and resilience - a built environment with net zero whole life resource depletion, that supports restoration of resources and natural systems within a thriving circular economy

Recs for Energy Performance Directive (EPBD)

- Introduction of CO_2 emissions along the life cycle as a requirement
- Consideration of embodied carbon in long-term renovation strategies
- Upgrade nZEB to "Net Zero Carbon"
- Enable circular buildings by tracking relevant data throughout the lifecycle
- Building Renovation Passports can facilitate the consideration of trapped carbon in major renovations
- Consideration of embodied carbon in binding minimum energy performance standards (MEPS)
- Strengthening sustainability standards for products and materials and preparing the market by introducing soft and voluntary limit values
- Prioritization of public buildings as a good example
- Improvement of knowledge about embodied carbon in accounting and mitigation strategies

Food for thought

- Low-hanging fruits! With many of the cost-effective measures to reduce operational energy use and related emissions have been adopted already, adopting lifecycle approaches can provide the basis for better allocation of both, environmental and financial resources
- Start with carbon reporting requirements, build benchmarks and set target values; start with voluntary measures to build capacity
- Consistently increase weight of non-price criteria in public procurements (environmental and quality criteria)

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