



University of
Strathclyde
Glasgow

Mission Board Discovery Workshop - 27/10/26

Lessons for Scotland from global & UK policy trends

Dr Jannik Giesekeam

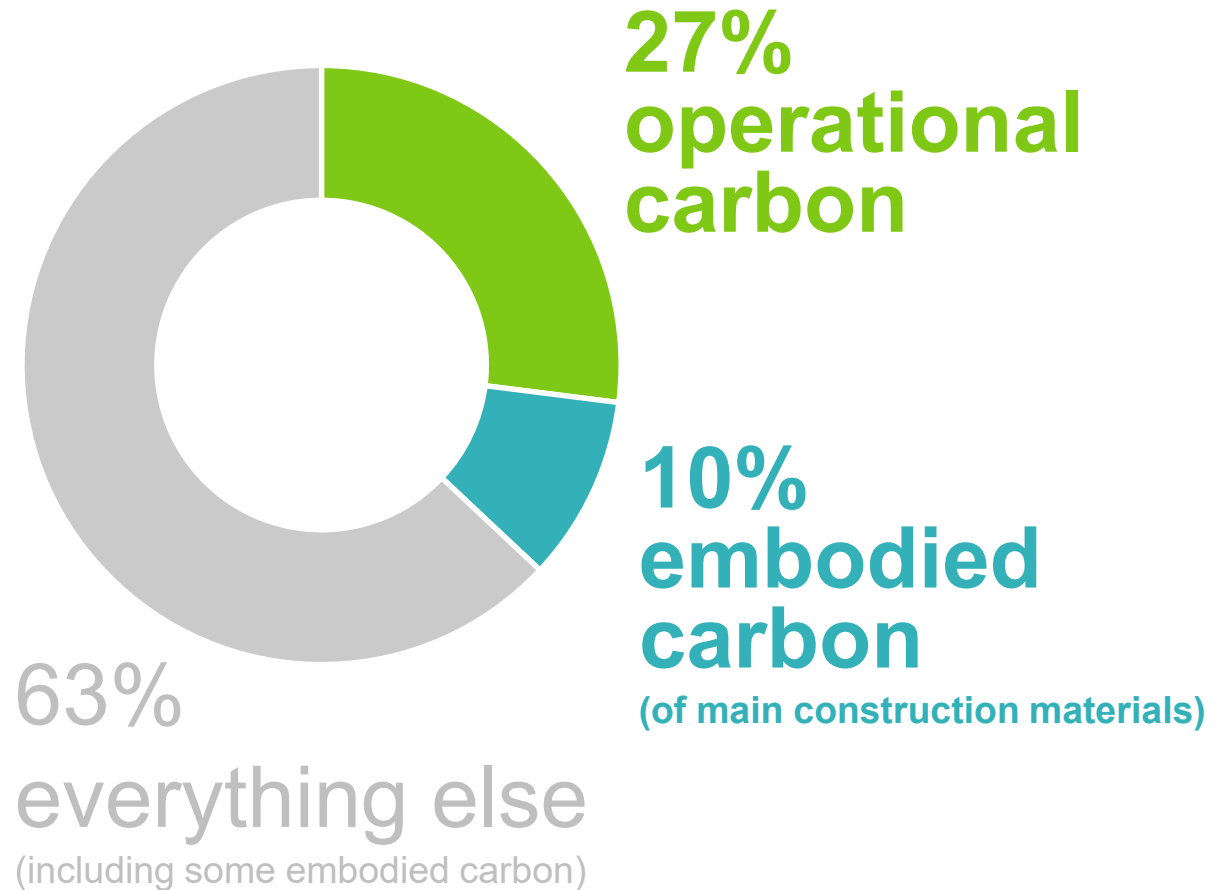
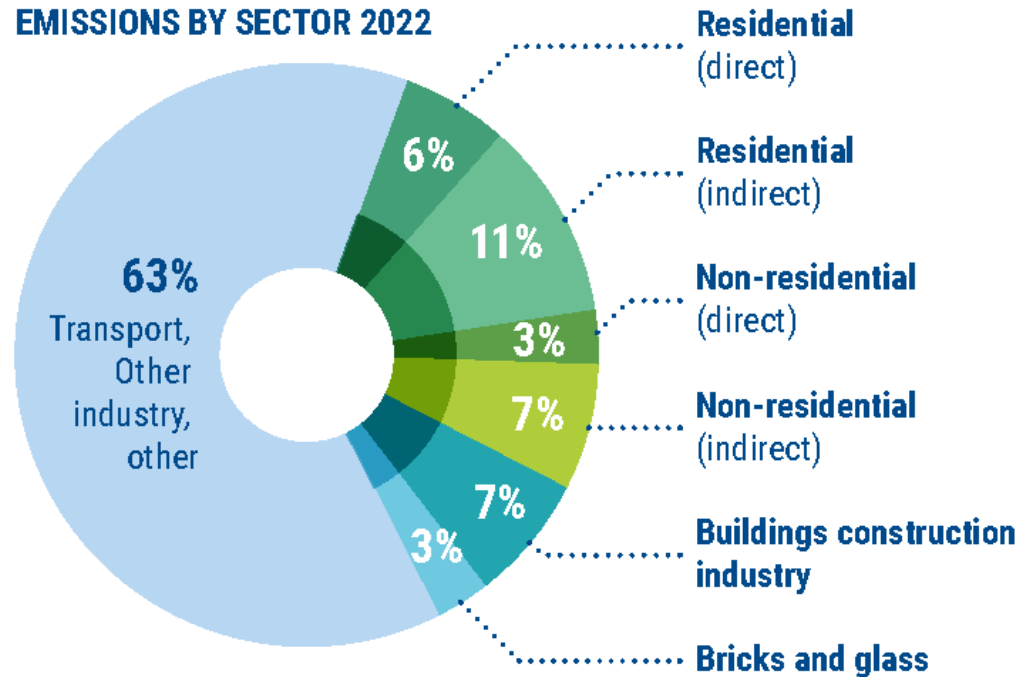
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GLOBAL TRENDS

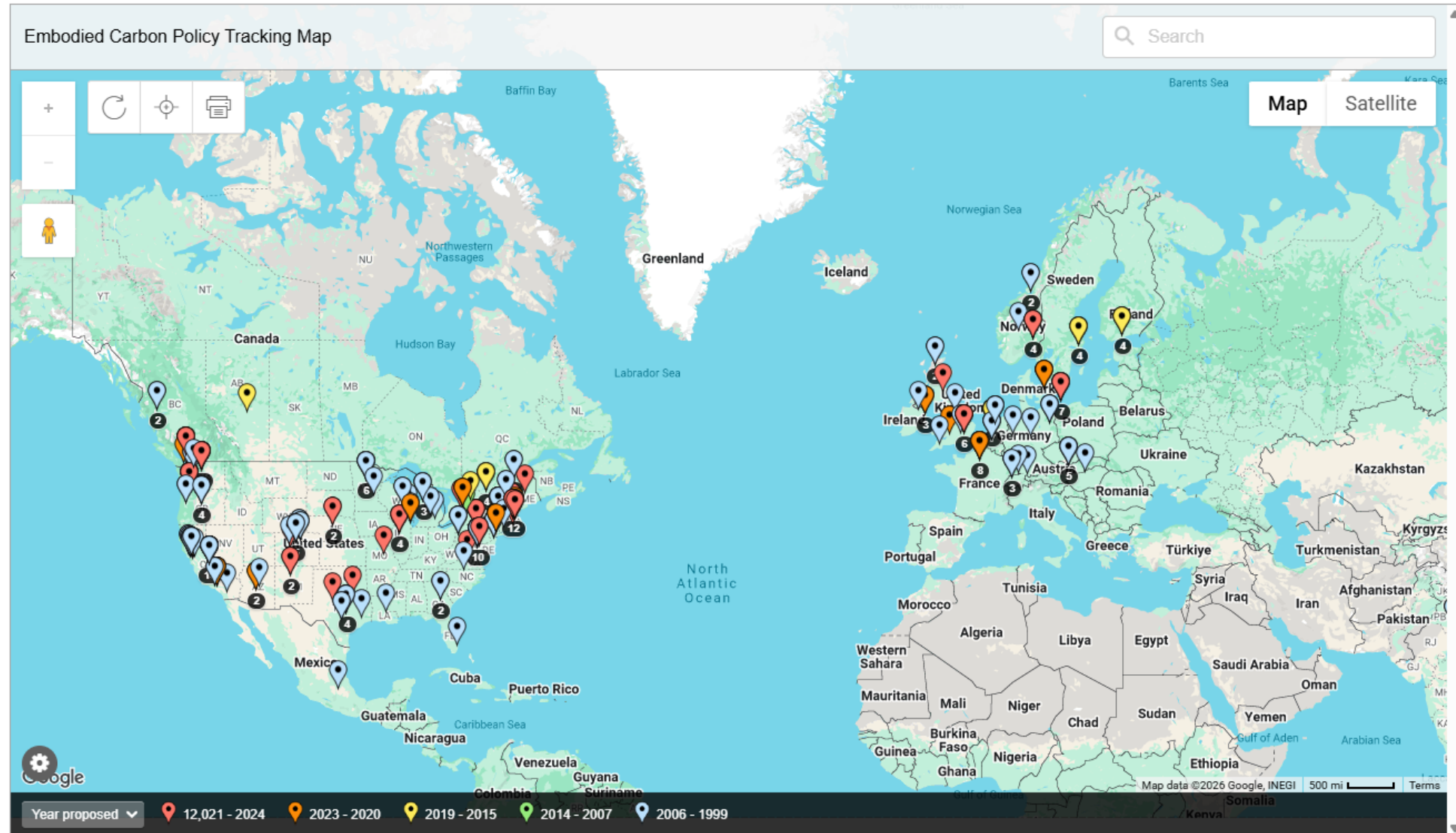
Towards embodied or whole life carbon

Global energy & process CO₂ emissions

EMISSIONS BY SECTOR 2022



Emerging global policy trend



High-level ministerial fora & workplan



FORUM MONDIAL
BÂTIMENTS ET CLIMAT
BUILDINGS AND CLIMATE
GLOBAL FORUM



60+ Countries
Members & Observers



Troika Leadership
France, Brazil, Kenya



**Established →
Launched**
Paris 2024 → COP29,
Baku 2024



**First Ministerial
Meeting**
COP30, Belém in 2025

Intergovernmental Council for Buildings and Climate

Global platforms

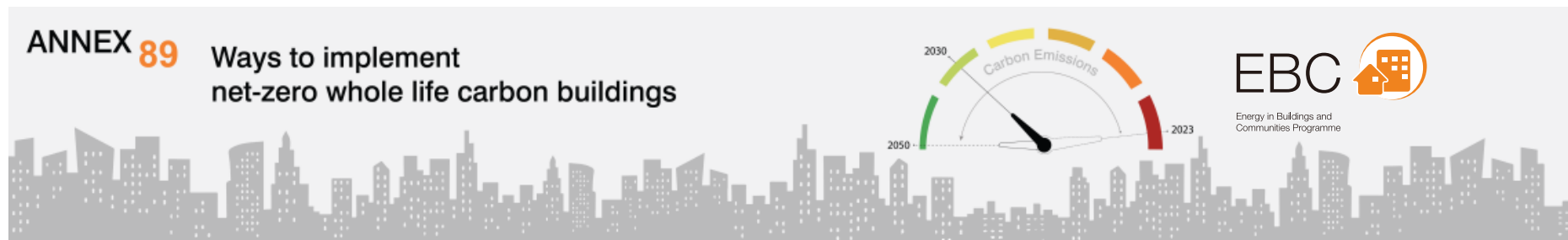


Global Alliance
for Buildings and
Construction

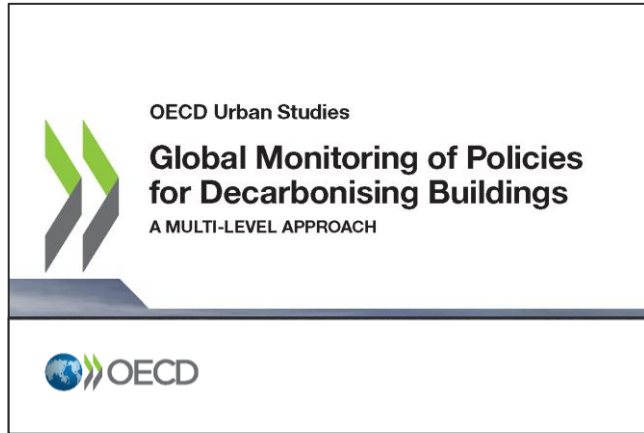


Global Building
Data Initiative

Coalition for life cycle emissions alignment and reporting (CLEAR)



Proliferation of regulations



11% of respondents: embodied carbon in policy, further 43% of respondents 'future priority'



EU Energy Performance in Buildings Directive: regulating embodied carbon **starting 2028**

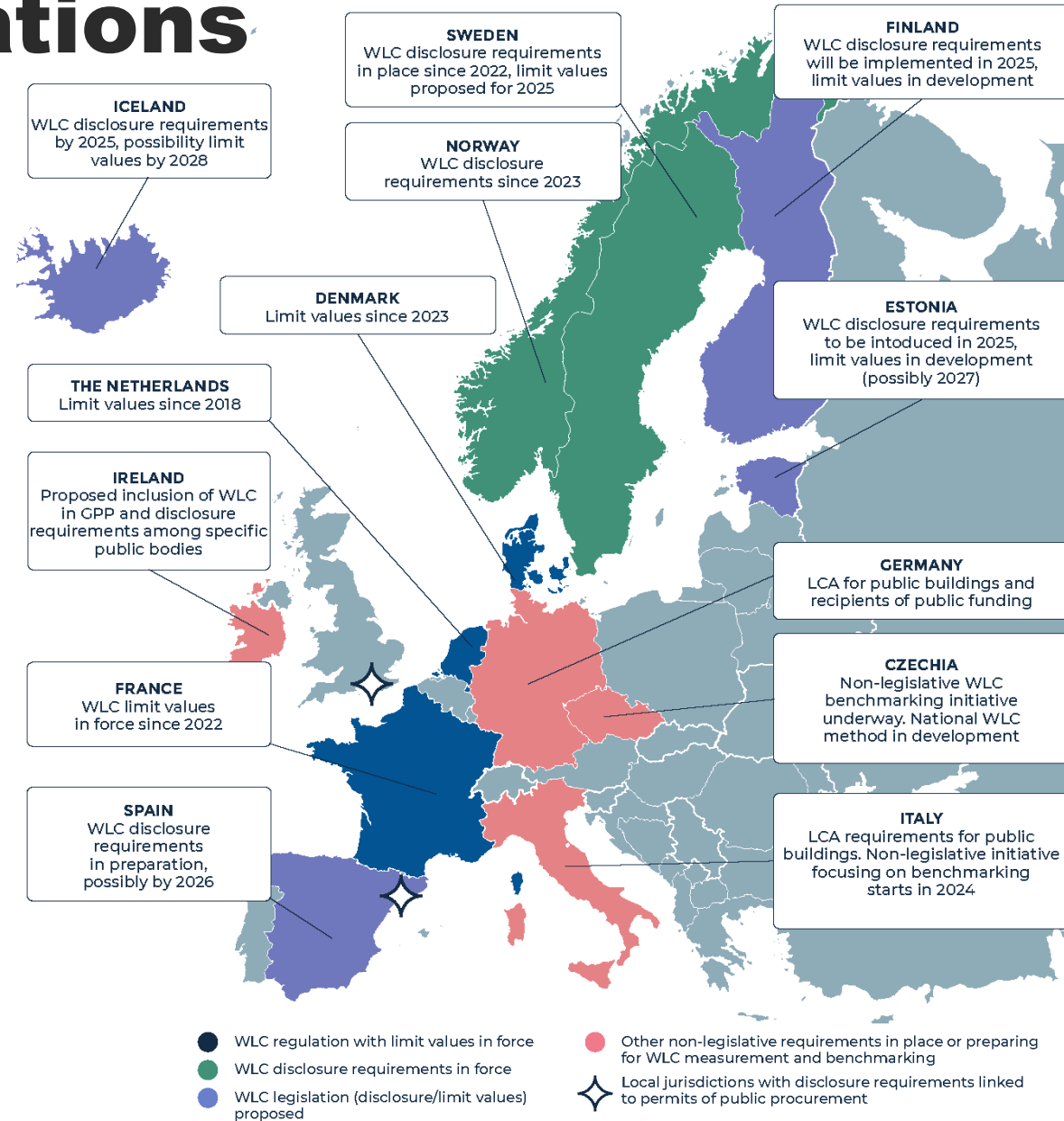
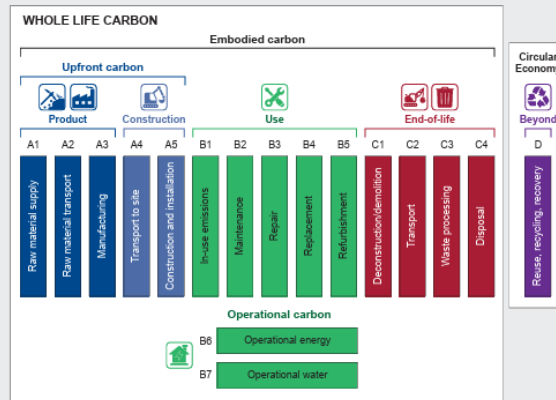


Figure from BPiE (2024) [How to establish whole life carbon benchmarks](#)

International policy reviews

International Survey of Mandatory Whole Life/Embodied Carbon Requirements in Building Codes and Regulations

June 2025



CONSTRUCTION CARBON REGULATIONS IN EUROPE REVIEW & BEST PRACTISES

OCTOBER 2022



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Made possible with support from:



Ympöristöministeriö
Miljöministeriet
Ministry of the Environment



Netherlands Enterprise Agency



EPBD implementation case studies

How life cycle GWP measures are being implemented by governments

Measures taken in
Denmark, France, Sweden and London



Variation in policy approaches

- **By scale:** local (e.g. London); national (e.g. France) or supranational (e.g. EU)
- **By scope:** products only (e.g. Buy Clean policies) or for buildings/infrastructure assets (e.g. Netherlands)
- **By mechanism:** prescription of specific design options (e.g. retrofit or timber first); assessment only (e.g. climate declarations); quantitative assessment plus qualitative statements (e.g. estimate whole life carbon then demonstrate design choices to reduce); or environmental performance-based requirements (e.g. must be $<600 \text{ kgCO}_2/\text{m}^2$)

Points of differentiation

- **Policy scope:** building types & size, exemptions, special conditions, retrofits etc.
- **Assessment scope:** building elements, life cycle stages, reference study period, treatment of biogenic carbon etc.
- **Required practice:** templates, scenarios, supporting databases, reporting units, limit values, submission intervals etc.
- **Implementation:** verification, enforcement, phasing etc.

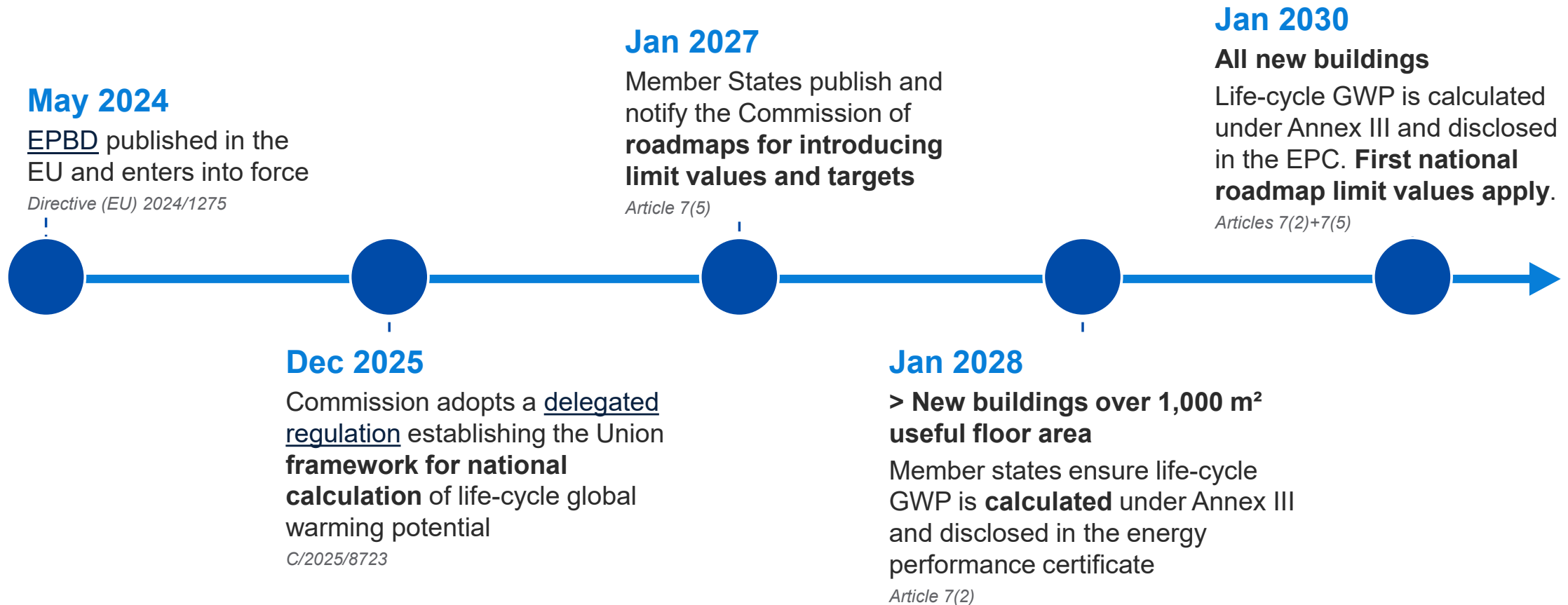
Most common European approach

- **Signal** intention: advise industry of intention to regulate
- **Develop** supporting infrastructure: national assessment methodology, reporting templates etc.
- **Report** emissions in line with mandatory requirement
- **Limit** emissions: set mandatory quantitative performance-based threshold (e.g. must be $<600 \text{ kgCO}_2/\text{m}^2$)
- **Reduce** limits over time: revise limits at stated intervals based upon prior reporting period

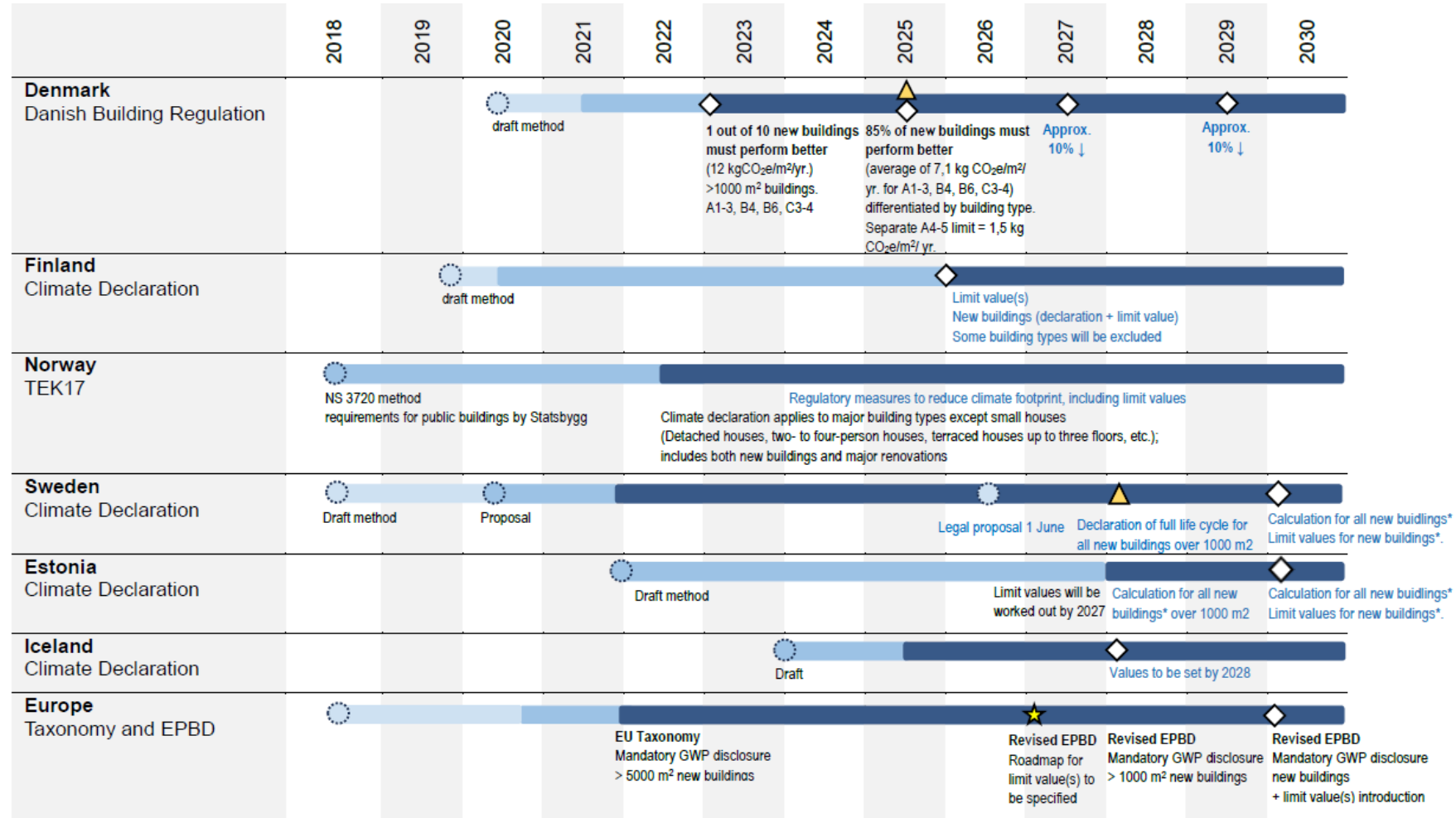
KEY INTERNATIONAL EXAMPLES

EU, Nordics & leading cities

Timeline for EU requirements



Timeline of Nordic regulations



- Integration in national legislation
- Test phase of coming regulation
- Preliminary method development
- Limit values (to be) integrated
- Draft method publication
- Declaration scope extension
- "Blue" indicates proposals, not final decisions
- ★ Roadmap
- * New buildings for which energy is used to condition the indoor environment

Comparison within Nordic countries

Included life cycle stages	Denmark	Estonia	Finland	Iceland	Norway	Sweden	Level(s)
A1-A3	✓	✓	✓	✓	✓	✓	✓
A A4 Transport to site	✓	✓	✓	✓	✓	✓	✓
A5 Construction	✓	✓	✓	✓	✓*	✓	✓
B1 Use in building							
B2 Maintenance							
B3 Repair							
B B4 Replacements	✓						
B5 Refurbishment							
B6 Energy	✓						
B7 Water							
C1 Demolition works							
C2 Transport							
C C3 Waste management	✓						
C4 Final disposal	✓						
D Additional	✓						
*Only waste included							

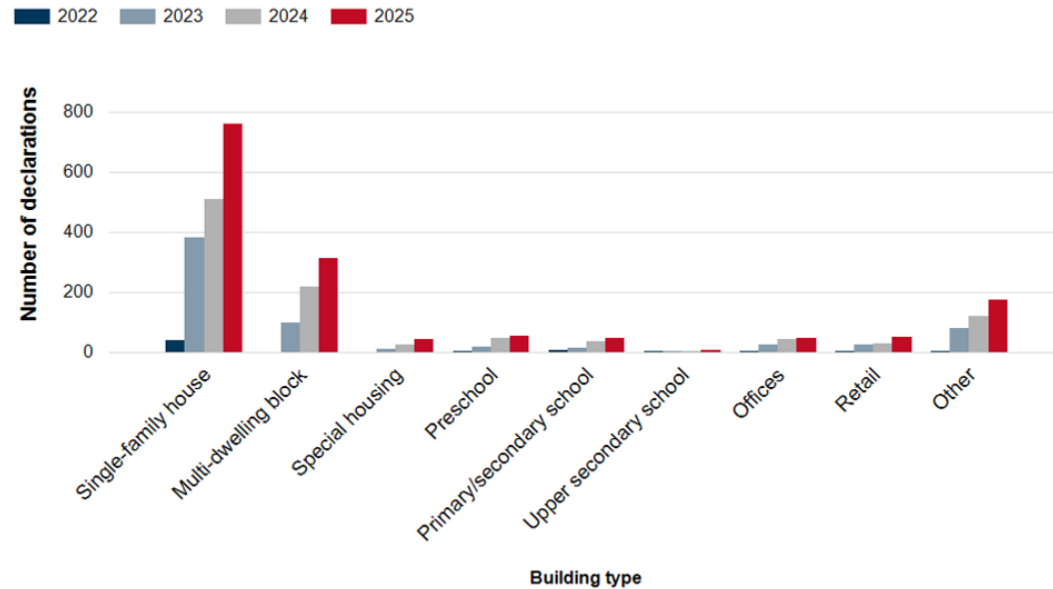
	Denmark	Estonia	Finland	Iceland	Norway	Sweden	Europe
Included building parts	BR28	Proposed draft method for climate declaration (2021)	Climate declaration	Climate declaration proposal (under development)	TEK17	Climate declaration 2022	Limit values 2025 Climate declaration 2027 (Boverket's proposal)
Site preparation	-	-	soil stabilization and site reinforcement elements	-	-	-	reported separately from 2027
Substructure							
Foundations	X	X	X	X	X	X	X
Piling	X	X	X	X	X	X	X
Basement walls	X	X	X	X	X	X	X
Ground floor structure	X	X	X	X	X	X	X
Superstructure							
Frame (columns, beams)	X	X	X	X	X	X	X
External walls, façade	X	X	X	X	X	X	X
External doors, windows	X	X	X	X	X	X	X
Balconies	X	X	X	X	X	X	X
Roof structures	X	X	X	X	X	X	X
Internal walls, load-bearing and non-load bearing	X	X	X	X	X	X	X
Floor slabs	X	X	X	X	X	X	X
Internal doors	X	X	X	X	X	X	X
Stairs and ramps	X	X	X	X	X	X	X
Wall and ceiling interior finishes and coverings	X	X	X	X	X	X	X
Flooring materials	X	X	X	X	X	X	X
Suspended ceilings	X	X	X	X	X	X	X
Internal finishes							
Lifts and escalators	X	X	X	X	X	X	X
Building services							
Electricity system	-	-	X	X	X	X	X
HVAC system	X	X	X	X	X	X	X
Renewable energy systems	X	X	X	X	X	X	X
Water system	X	X	X	X	X	X	X
Sewage system	X	X	X	X	X	X	X
Other systems (e.g. firefighting)	-	-	X	X	X	X	X
External works	only if included in the area definition	-	only external structures on yard	-	-	-	-
Furnishing							
Fixed furniture	-	-	X	-	-	-	-
User furniture	-	-	-	-	-	-	-

Country/Region	(in place or proposed) Regulation	RSP	Floor area definition	external wall thickness	Primary functions	Secondary functions (e.g. circulation area, storage)	Internal walls and columns	Basement/cellar	Stairs	Common facilities (in multi-units, incl. staircase, lift, vertical voids)	Enclosed car park connected to building	Attic	Roof/terrace	Plantrooms on roof	Balcony	External area including car park
Denmark	Danish Building regulation (BR28) – embodied part	50	reference area	X	X	X	X	If ceiling height > 1.25 m	X	counted for all floors	included with 50%	Only if > 1.5 m high	included with 25%	X	-	included with 25% (for external areas only when connected to the building)
	Danish Building regulation (BR28) – operational part	50	heated gross floor area	X	Included if heated	X	If ceiling height > 1.25 m included with 40%	-	-	counted for all floors	-	Only if > 1.5 m high	-	-	-	-
Estonia	Proposed method for climate declaration (2021)	50	heated net floor area	-	Included if heated	X	Included if heated	-	-	-	-	-	-	-	-	-
Finland	Proposed method for climate declaration (2021)	50	heated net floor area	-	Included if heated	X	X	X	X	-	X	X	X	X	X	-
Norway	TEK17	50	gross floor area	X	X	X	X	Included if > 1.9m high for a width of ≥ 0.6m	-	-	X	Included if > 1.9m high for a width of ≥ 0.6m	Included in enclosed by glass	X	-	-
Sweden	Klimadeklaration 2022	N/A (50)	gross floor area	X	X	X	X	X	-	-	X	Included if > 1.9m high for a width of ≥ 0.6m	-	X	X	-
	Swedish Building regulation (BBR29) Operational energy calculation	50	heated net floor area	-	Included if heated	X	X	X	X	Included if heated	-	Included if heated	-	-	-	-
Europe	Level(s) – Office	50	IPMS 3 Useful floor area	-	X	X	X	If in exclusive use	-	-	-	-	Separate item	-	Separate item	-
	Level(s) – Residential	50	IPMS 3B Useful floor area	-	X	X	X	Separate item	Only on ground floor	-	Separate item	Separate item	Separate item	Separate item (unless common facility)	Separate item	-

Follow [Nordic Sustainable Construction](#) or [read more about comparisons](#)

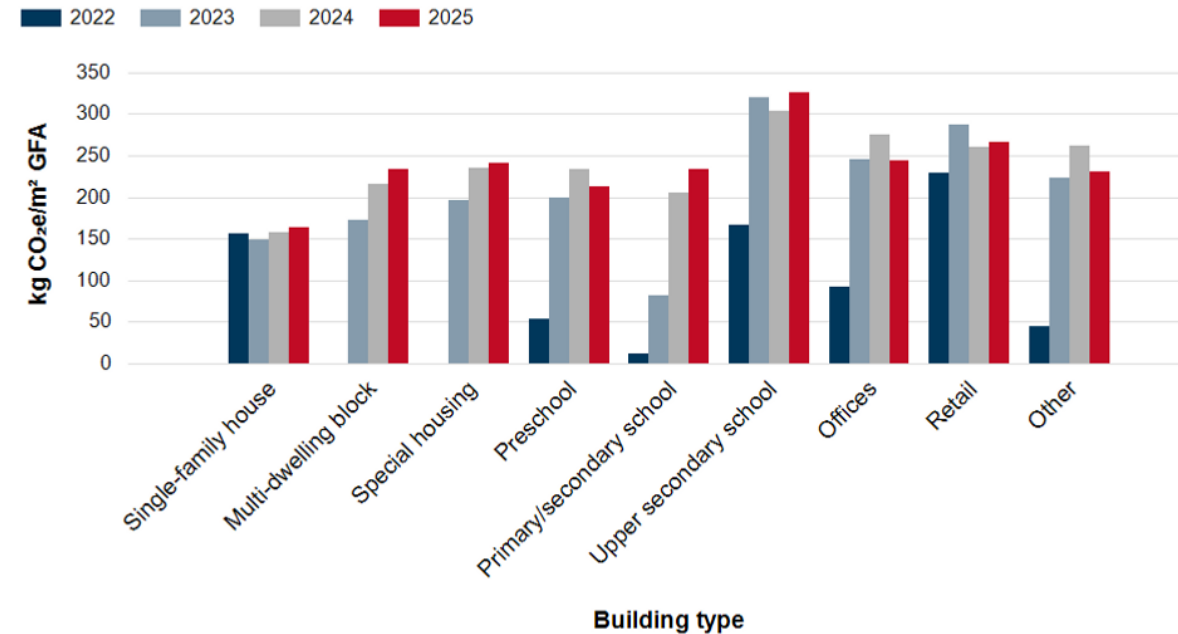
Example – Swedish results so far

Number of climate declarations per building type and year



- 3274 climate declarations submitted up to end of 2025
- Proportion based on EPD increased from 10-38%

Climate impact per building type and year, median of total climate declarations per kg CO₂e/m² GFA



- Compliance quality increasing
- Median kgCO₂/m² lower than anticipated in policy impact assessment

Example – Denmark

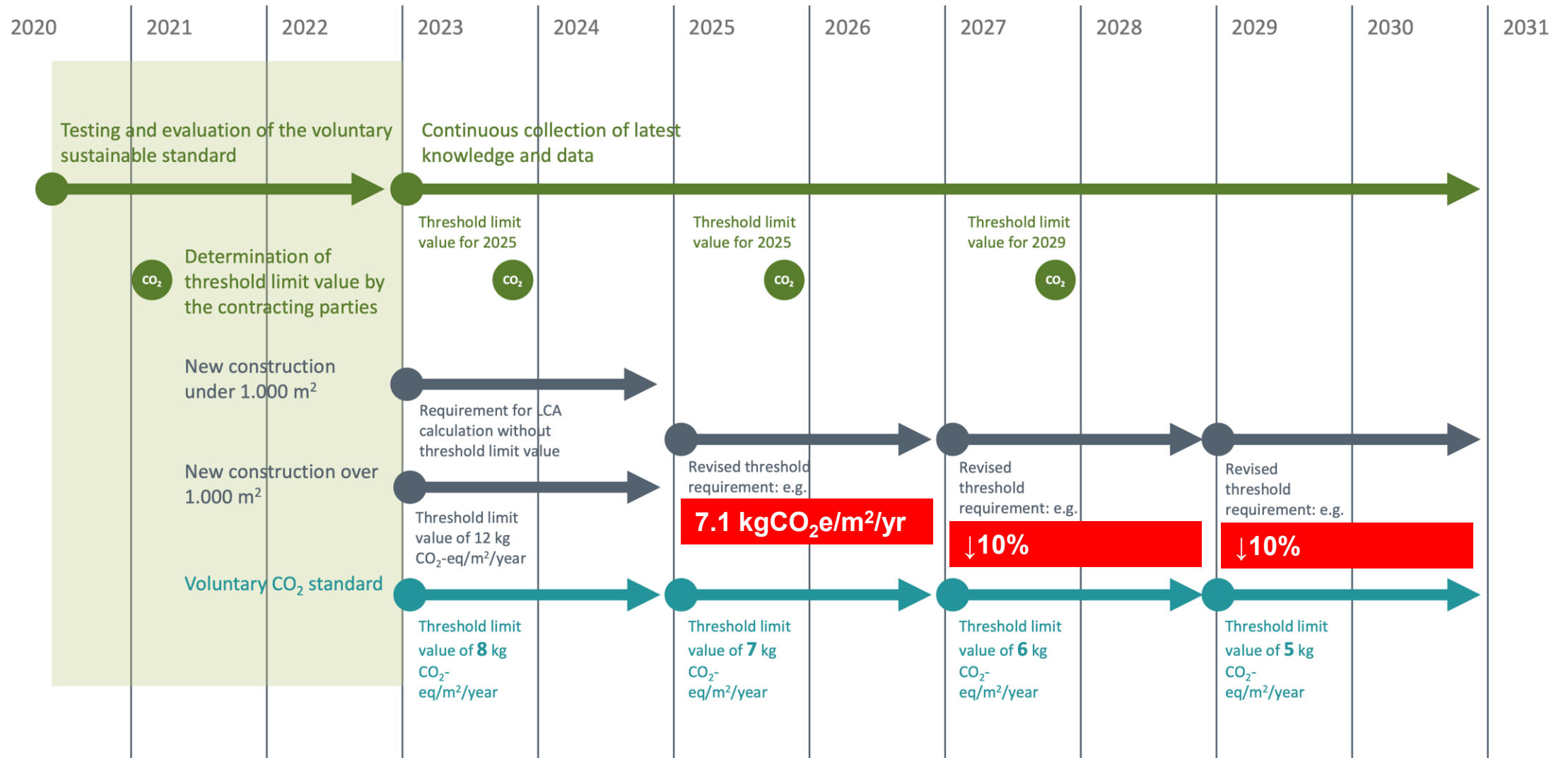


Figure from [LCAByg](#). For overview of changes to limit values see [article from Nordic Sustainable Construction](#).

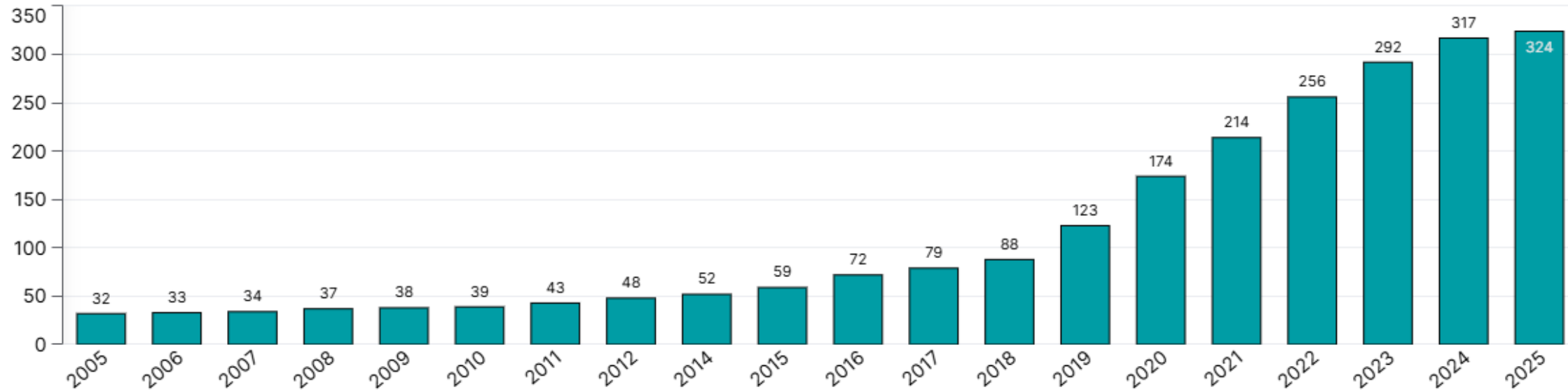
Example – current & future Danish limits

Limit values for new construction (kgCO ₂ e/m ² /year)	2025	2027	2029
Average limit value	7.1	6.4	5.8
Holiday homes <150 m ²	4.0	3.6	3.2
Holiday homes ≥150 m ² , single family and row houses	6.7	6.0	5.4
Apartment and office buildings	7.5	6.8	6.1
Institutions and other building typologies	8.0	7.2	6.4
<i>Individual limit value for construction process</i>	<i>1.5</i>	<i>1.3</i>	<i>1.1</i>
Average limit value including construction process	8.6	7.7	6.9

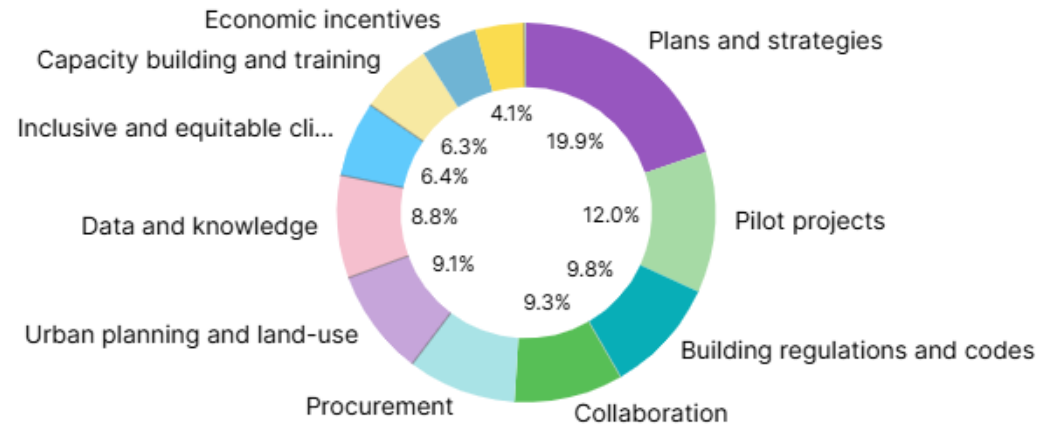
Proliferation of city policies

Number of policies/actions and themes adopted over the years

Cumulative

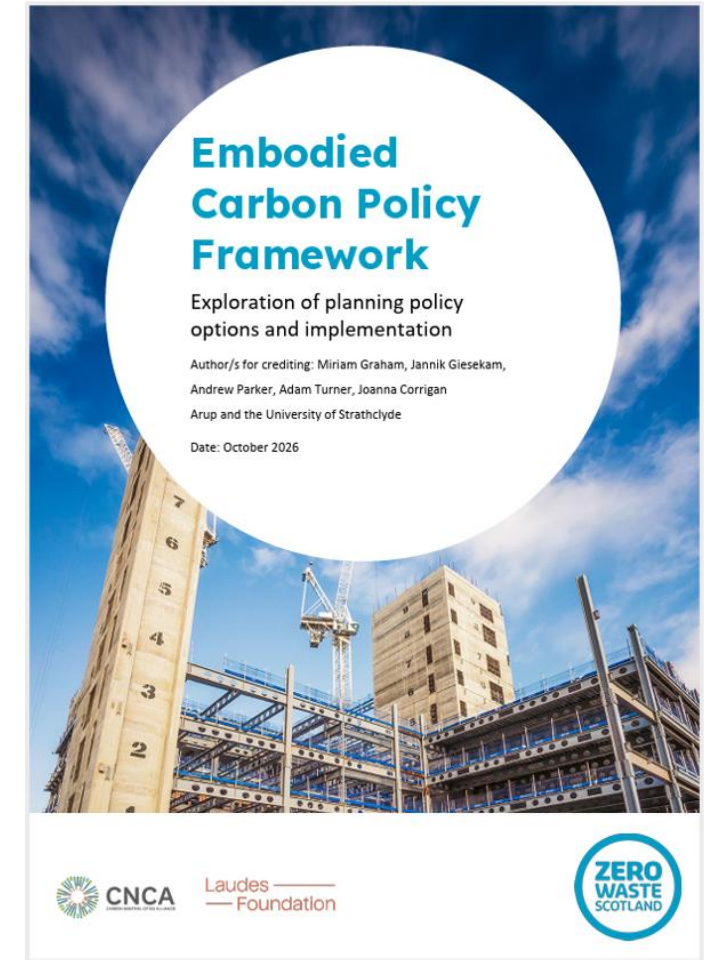
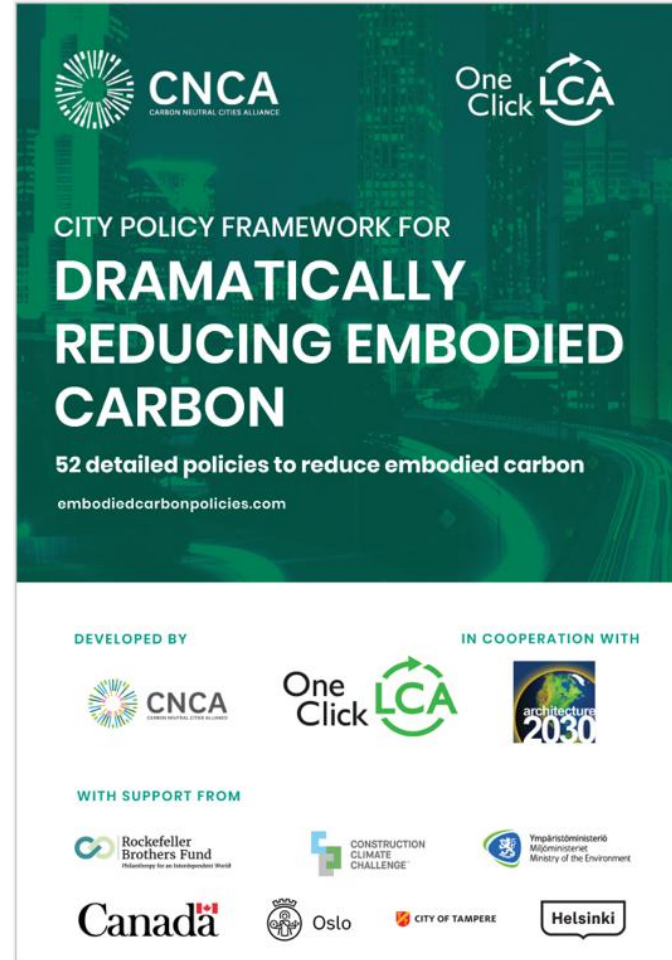
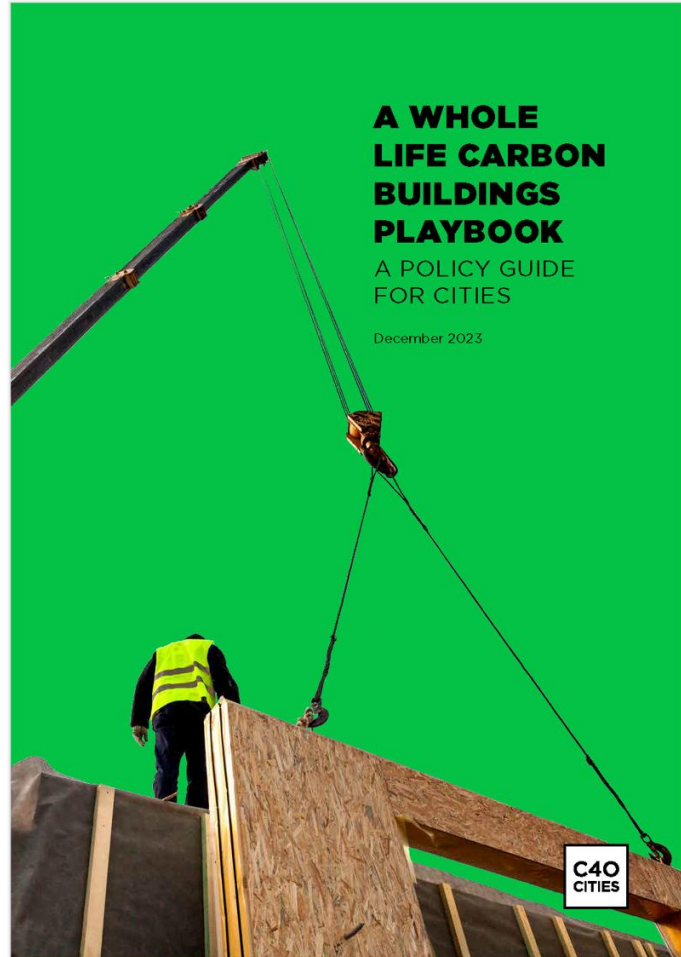


Distribution of policy/action types



Figures from C40 (2026) [Clean Construction Policy Explorer](#)

Local policy development guides

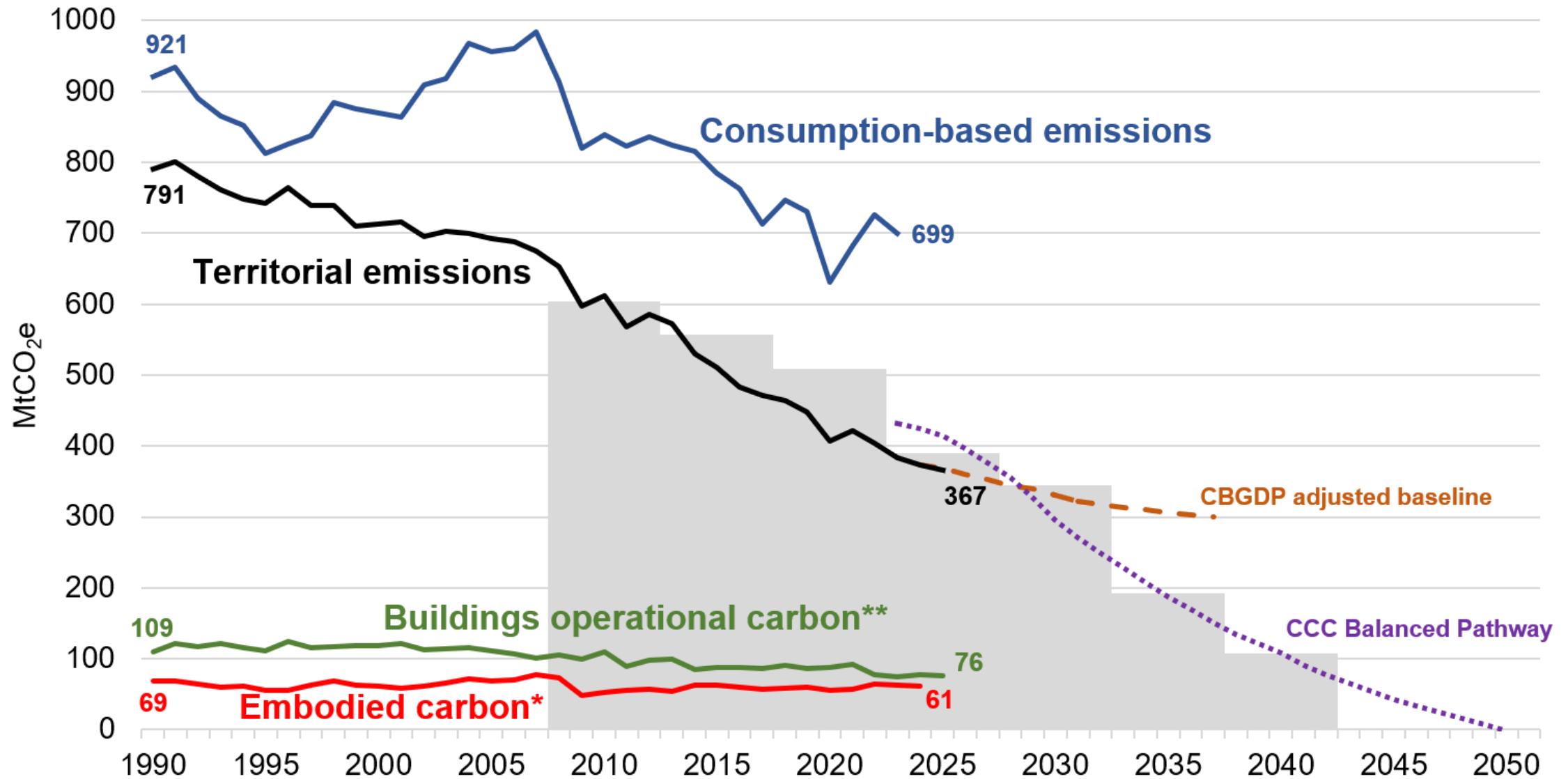


CNCA & OneClickLCA (2020) [City Policy Framework for Dramatically Reducing Embodied Carbon](#); C40 (2023) [A whole life carbon buildings playbook](#)
Zero Waste Scotland, CNCA & Laudes Foundation (2026) [Embodied Carbon Policy Framework](#)

UK CONTEXT

Evolving ecosystem of rules, tools & skills

Embodied carbon is ~9% of UK emissions

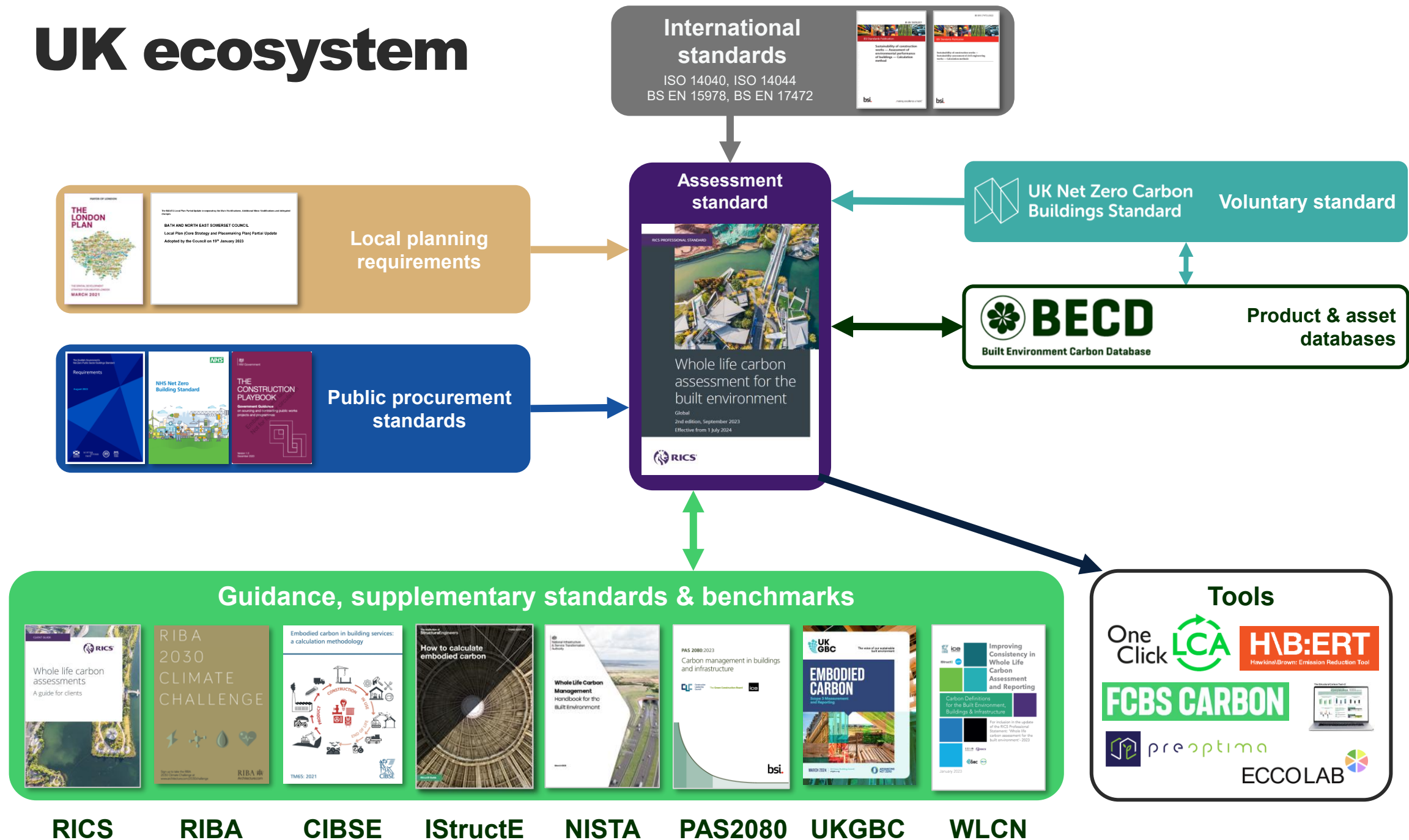


Territorial emissions from DESNZ's provisional national statistics to 2025 & consumption-based emissions from Defra's 2026 release of UK's Carbon Footprint.

*Embodied carbon of built environment from UKGBC 2025 Whole life carbon roadmap progress report.

**Buildings operational carbon from CCC 2026 Progress report to Parliament.

UK ecosystem



RICS

RIBA

CIBSE

IStructE

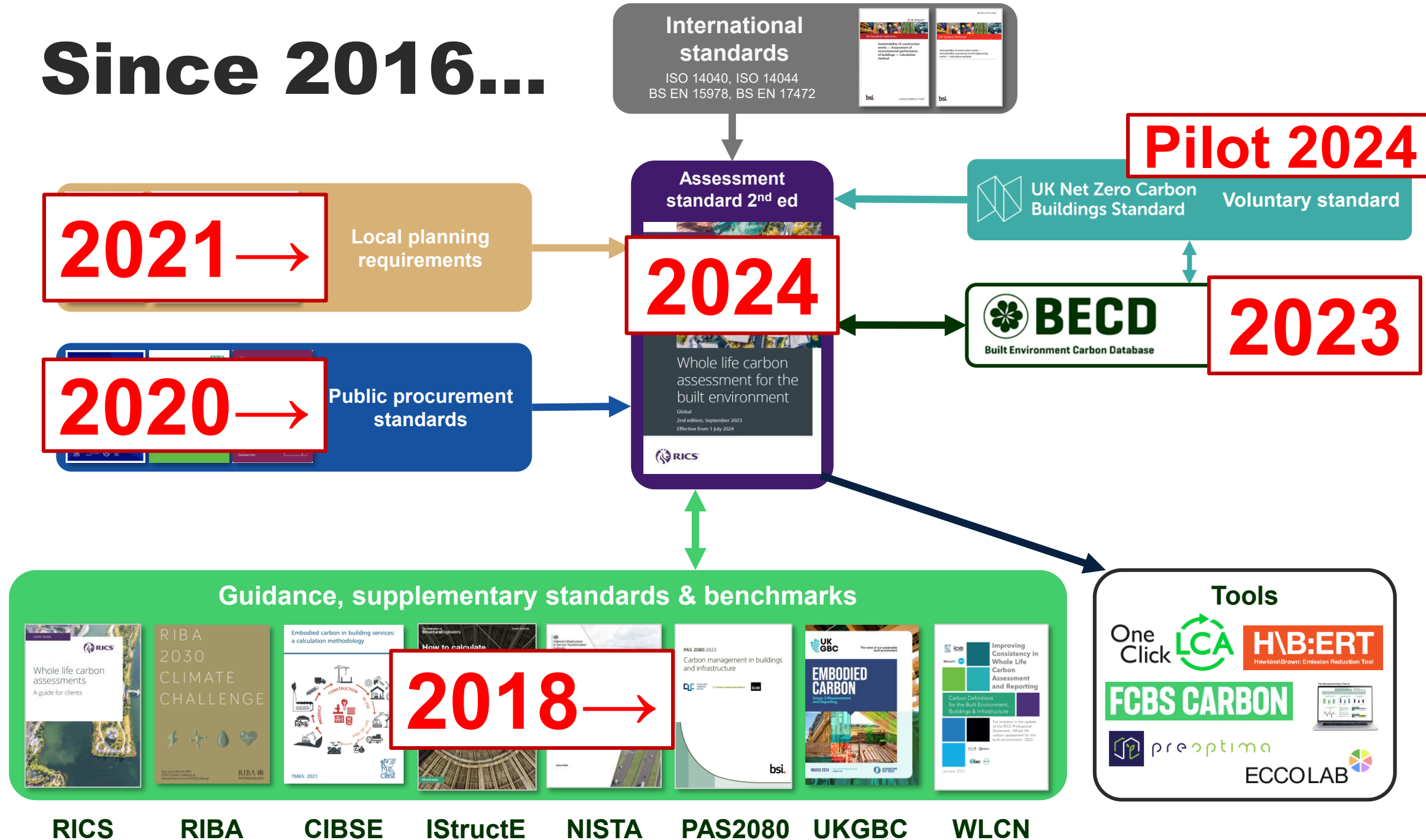
NISTA

PAS2080

UKGBC

WLCN

Since 2016...



PLANNING REQUIREMENTS

English local authorities

Proliferation of local requirements

LPA's within Greater London Authority (GLA)

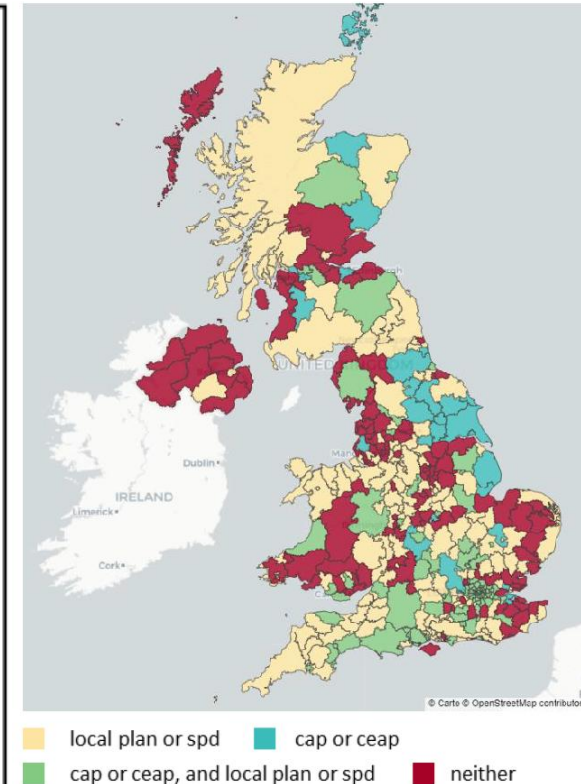
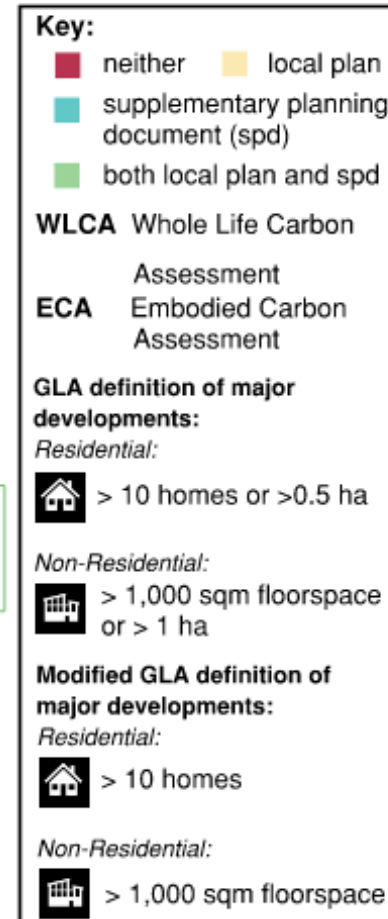
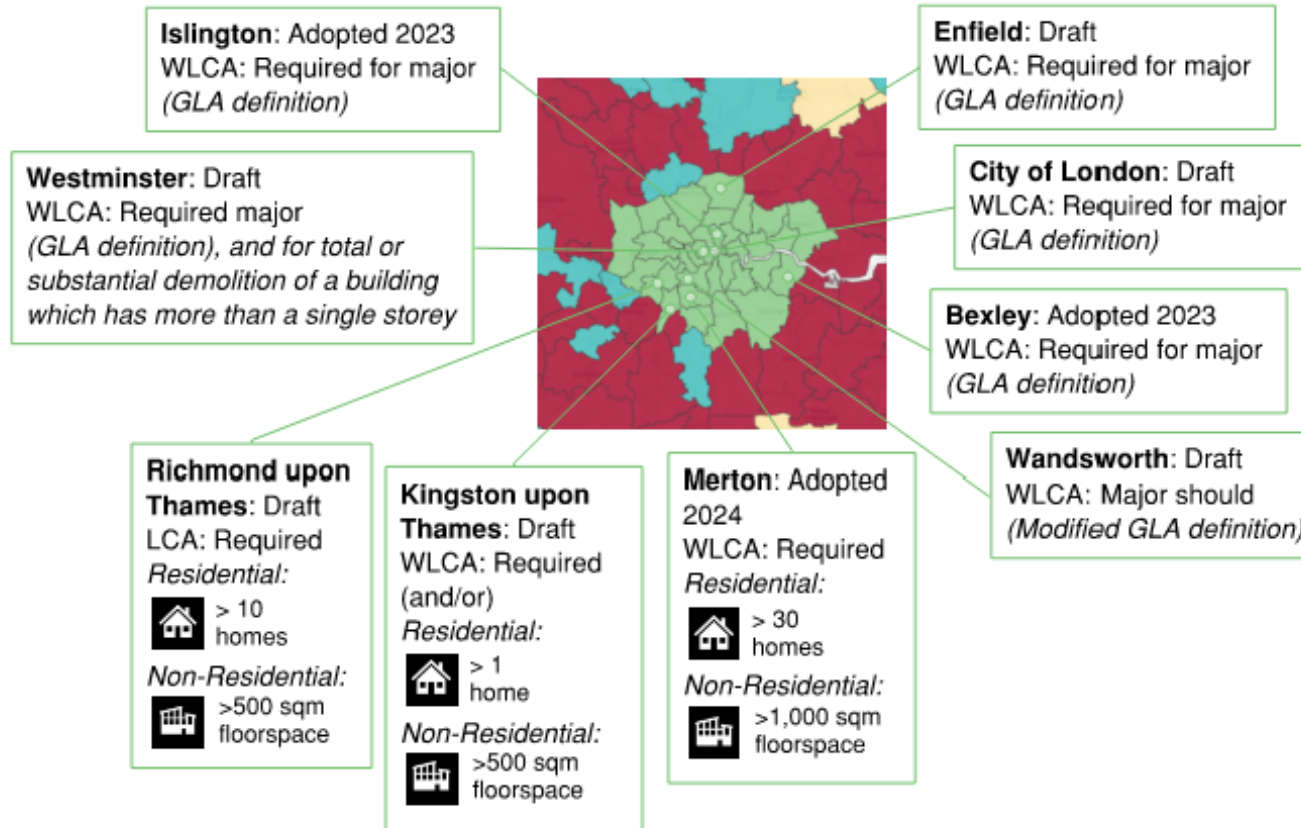


Figure 4: Comparing whether Local Plans or Supplementary Planning Documents and Climate or Circular Economy Action Plans applying to an LPA contain occurrences of 'Embodied Carbon'.

Requirements beyond London

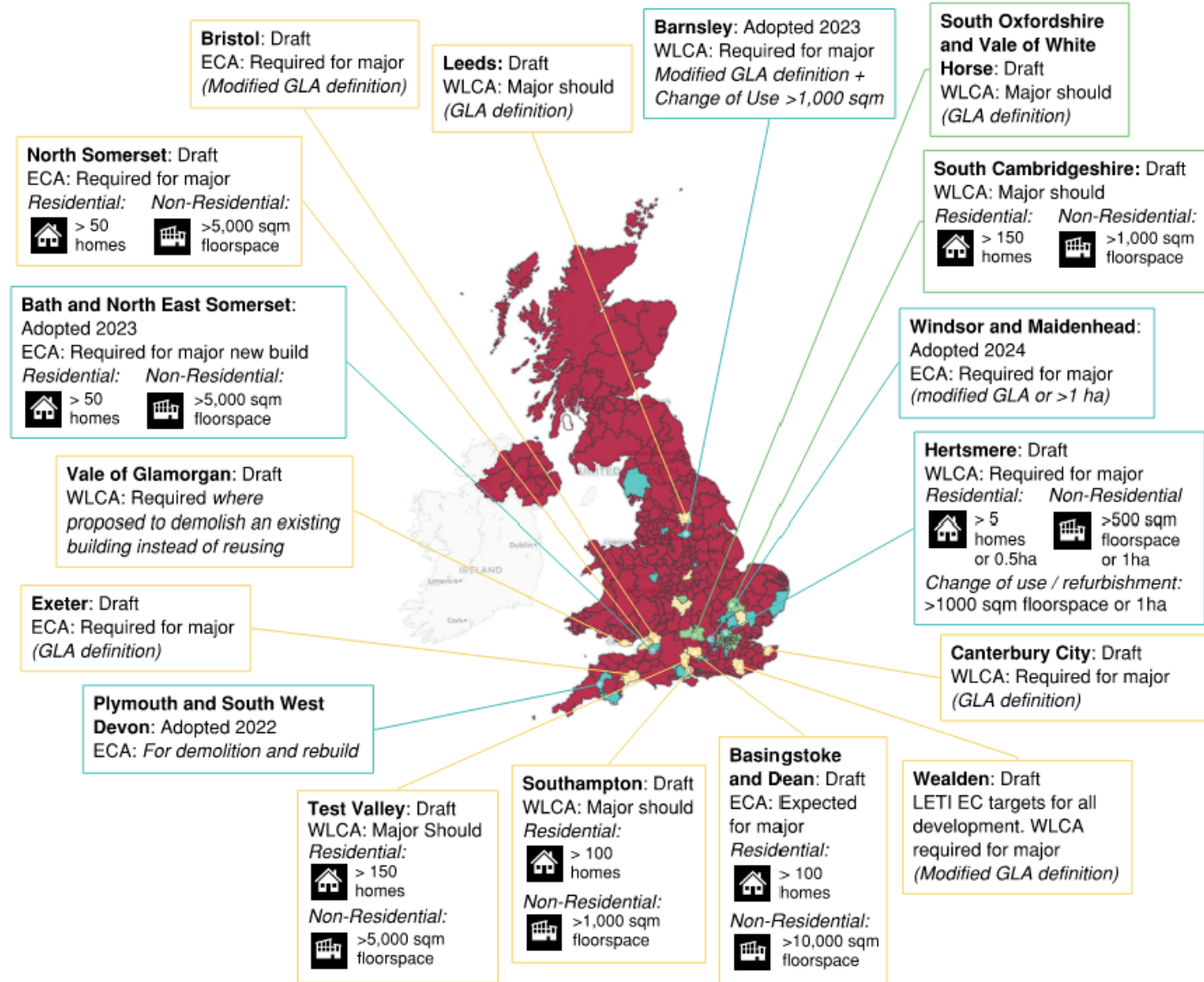


Figure from review by Graham et al. (2024) [Embodied Carbon and the Circular Economy: Analysing UK Planning Systems and Policy](#)

Key gaps

- Knowledge sharing & information synthesis
- Assessments of policy impacts & efficacy
- Lack of common approach (e.g. thresholds, limits etc.)
- Lack of common resources (e.g. reporting templates)
- Skills within planning community

Experiences of local authorities

- Recent workshops with 25 leading local authorities highlighted the need for greater support (e.g. with templates, tools for verification & skills) & common desire for national approach

Embodied Carbon and the Circular Economy: Opinions from LPA workshops
(21 participants, values shown as %)

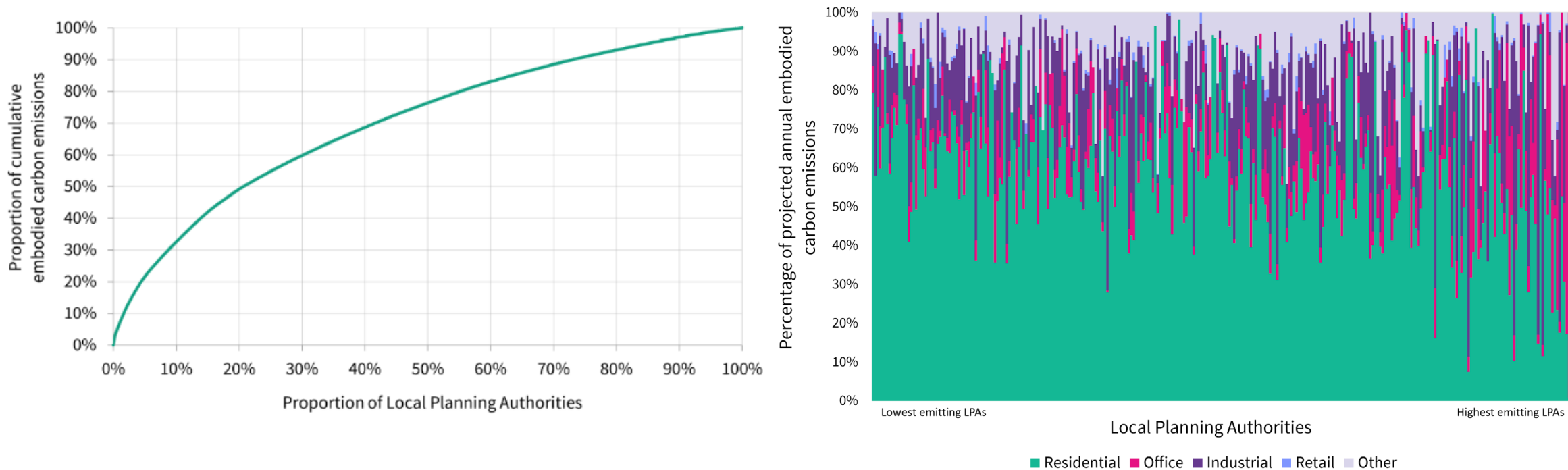
	Disagree	Indifferent	Agree	Don't know
Embodied carbon assessment / WLCA policy at a project level is required to address embodied carbon in the built environment.	0	0	95	5
Policy intervention is needed to encourage reuse and retrofit of existing buildings and prevent demolition.	0	0	90	10
Technical standards are generally consistent across authorities (in line with industry standards), however there are choices within these causing fragmentation.	19	10	33	38
Variation in WLCA policy across authorities creates difficulties for authorities and/or applicants.	0	19	62	19
There is concern within the authority of developments moving to other LPAs if stricter limits / requirements were implemented in my LPA and not in other LPAs.	24	24	33	19
Resource and skill constraints limit our ability to verify and appraise assessments.	0	19	57	24
Our planning team would benefit from accessible, planner-focused guidance and training.	0	5	81	14
Planning is best suited for early-stage design influence, whereas building control is better suited for later stage accountability.	10	10	62	19

National Government Recommendations for Whole Life Carbon Assessment (WLCA), pre-redevelopment audits and demolition audits:
(21 participants, values shown as %)

	Would be problematic	Is unlikely to be beneficial	Indifferent	Is likely to be beneficial	Is needed	Don't know
Provision of consistent templates and reporting formats	0	0	0	57	38	5
Standardisation of technical frameworks	0	0	5	38	48	5
A standardised central evidence base, including centralised research on practical options and implications of embodied carbon reduction and circular economy measures for projects.	0	0	0	52	43	5
National digital tools for verification and appraisal	0	0	0	43	52	5
National WLCA requirement (supported by the above measures)	0	0	0	38	57	5

Projected emissions by local authority

- England's embodied carbon emissions are diffusely distributed across local authorities & current local policies only affect ~1% of projected embodied carbon

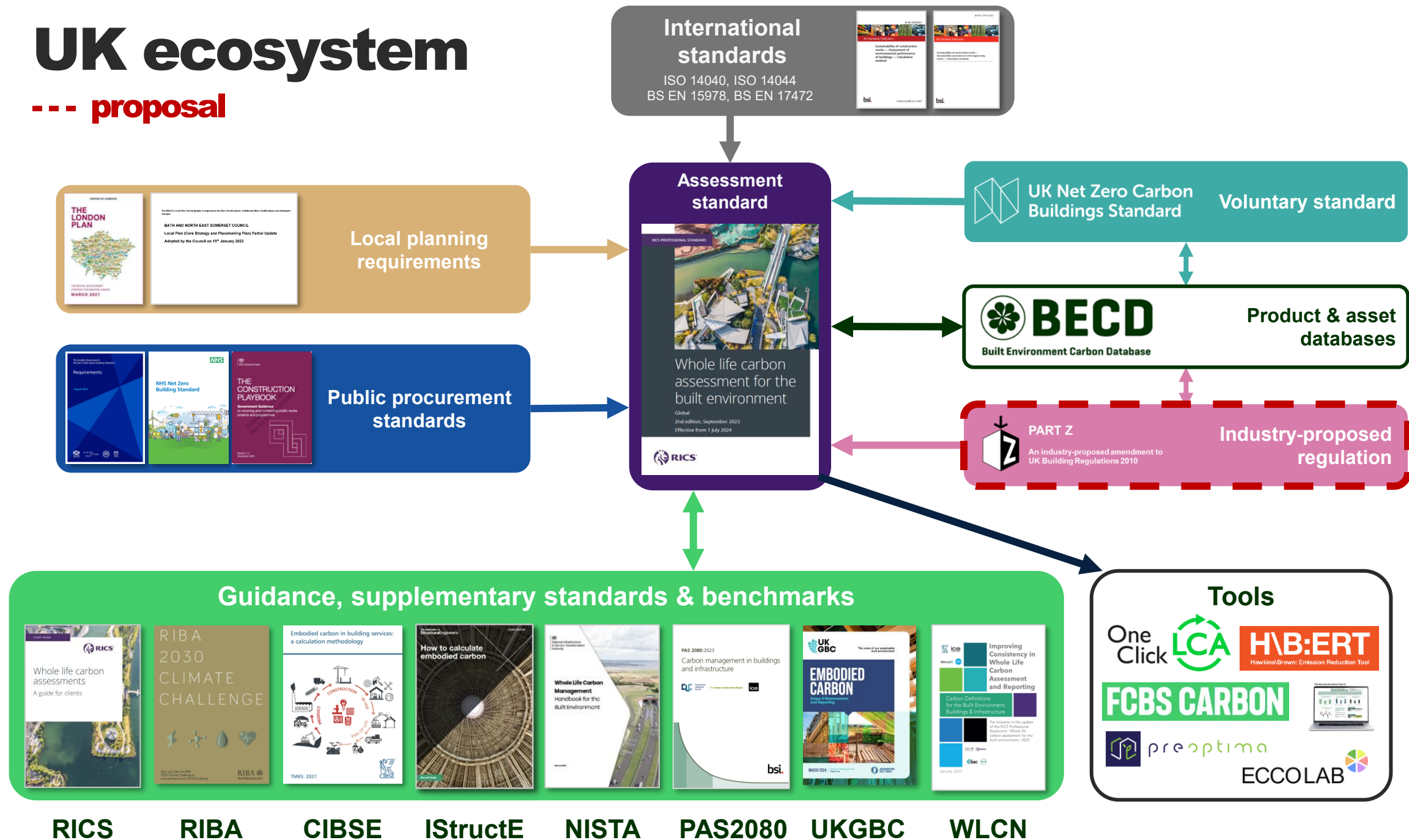


RECENT UK POLICY DEBATE

Part 2 & Westminster debates

UK ecosystem

--- proposal



RICS

RIBA

CIBSE

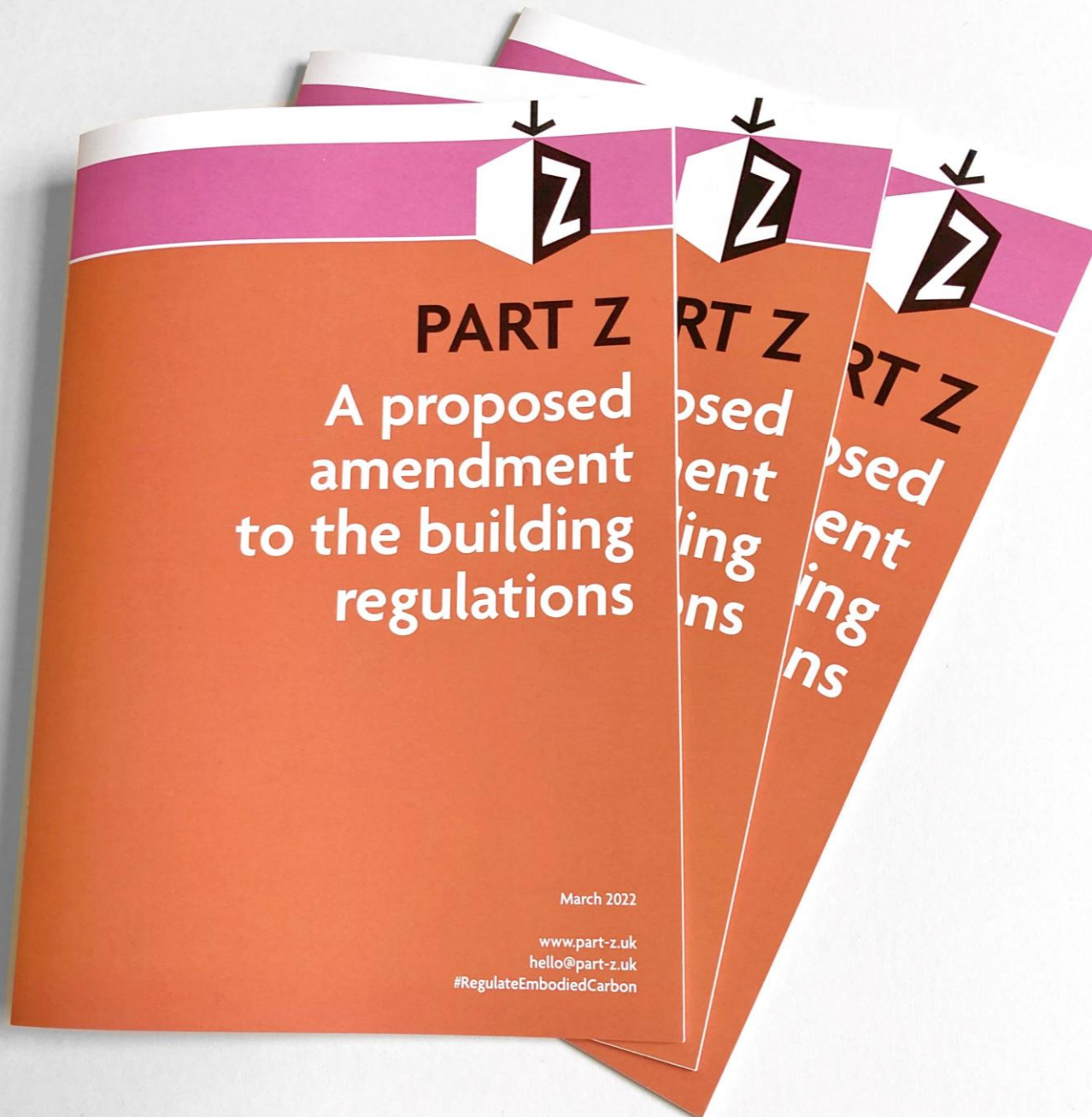
IStructE

NISTA

PAS2080

UKGBC

WLCN



Part Z

Industry led proposed amendment to Building Regulations in England & suggested document for approval



Available from part-z.uk

Part Z authors



Will Arnold
Low-carbon structures

IStruct 



Tim den Dekker
Net zero architecture

**Feilden
Clegg
Bradley
Studios**



Dr Jannik Gieseckam
International policy


**University of
Strathclyde**



Dr Julie Godefroy
Environmental design


CIBSE



Simon Sturgis
Whole life carbon

**targeting
zero**

Amendment to Schedule 1 of the Building Regulations (2010)

Requirement	Limits on application:
PART Z WHOLE LIFE CARBON	
Z1 Carbon assessment Z1. Whole life carbon emissions shall be assessed and reported for the building and any other parts of the project where Building Regulations apply.	Requirements Z1 and Z2 only apply to projects with a gross internal area of more than [1000]m ² , or that create more than [10no.] dwellings.
Z2 Carbon efficiency Z2. Reasonable provision shall be made for the minimisation of whole life carbon emissions by: (a) Minimising upfront embodied carbon; and (b) Where an item provides whole life carbon benefit, this is taken into account.	Requirement Z1 will apply to buildings other than dwellings from [1 January 2023], and dwellings from [1 January 2025]. Requirement Z2 will apply to all buildings from [1 January 2027].



An industry-proposed amendment to The Building Regulations 2010

Whole life carbon

INDUSTRY-PROPOSED DOCUMENT

Z

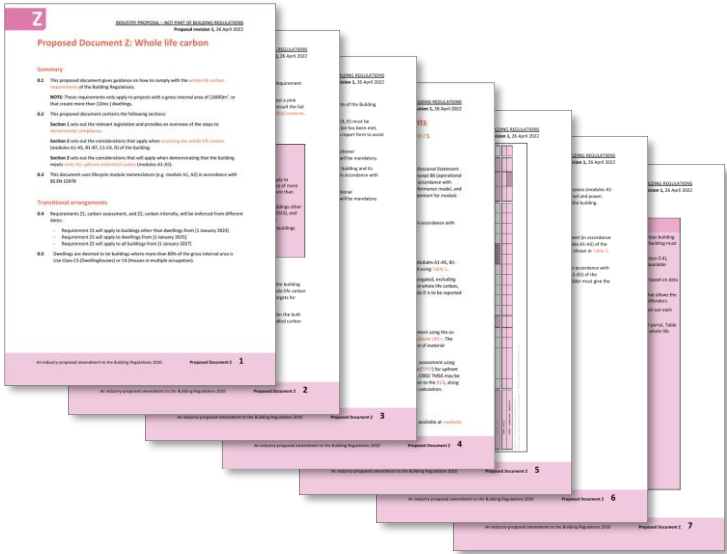
Z1 Carbon assessments
Z2 Carbon intensity

Disclaimer: This document is not part of the Building Regulations. It has been produced by and in conjunction with the construction industry as proof of concept in order to demonstrate one way in which embodied carbon could be introduced into UK regulation. For accompanying commentary on this document, visit www.part-z.uk, or contact hello@part-z.uk

Proposal revision 1
26 April 2022

A proposal from the construction industry

Proposed Document Z





Barratt Developments “welcome regulation to mandate the reporting of whole life carbon, leading to the eventual introduction of embodied carbon limits in construction”

“**JLL** supports amendments to Building Regulations requiring assessment of whole life carbon emissions and limitation of embodied carbon emissions”

“**abrdn** Investments are supportive of the regulation of embodied carbon.”

“**Royal London Asset Management** endorses the concept of regulation that mandates the reporting of – and sets limits on – embodied carbon emissions in the built environment.”

“**Stanhope** fully supports the principle of regulating upfront embodied carbon in construction.”

“**Landsec** [...] fully supports these assessments becoming a legal requirement as part of Building Regulations.”

See more at part-z.uk/industry-support

UK parliamentary consideration

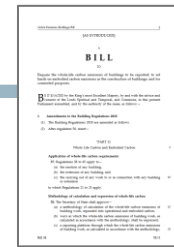
Feb 2022
Carbon Emissions (Buildings) Bill
 Duncan Baker MP



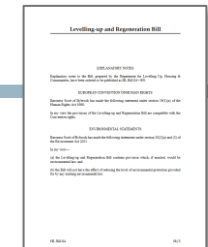
May 2022
Environmental Audit Committee
 Building to net zero: costing carbon in construction



Nov 2022
Carbon Emissions (Buildings) Bill
 Jerome Mayhew MP



Mar 2023
Amendment 280 to Levelling-up & Regeneration Bill
 Lord Ravensdale



Nov 2025
Environmental Audit Committee
 Environmental sustainability and housing growth



Sep 2025
Amendment 180 to Planning & Infrastructure Bill
 Lord Ravensdale



Dec 2024
Carbon Emissions from Buildings (Net Zero) Bill
 Dr Ellie Chowns MP

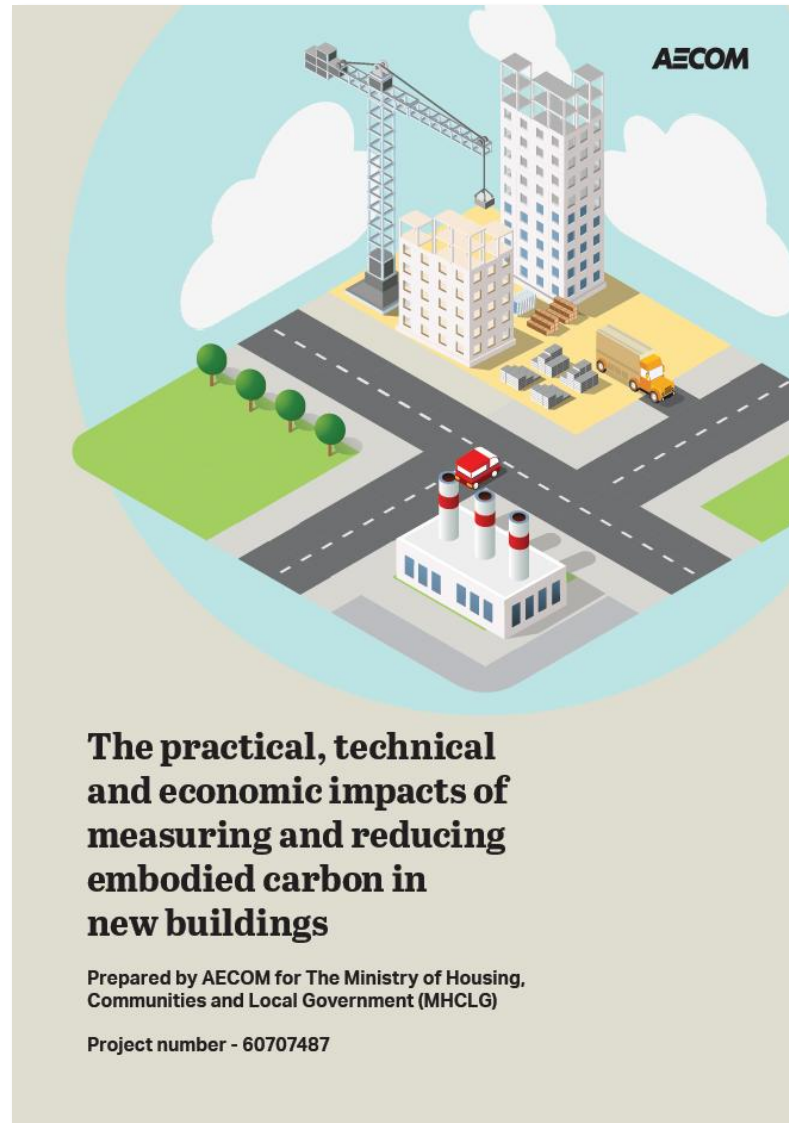


Jan 2024
Policy Position Paper
 RICS, RIBA, IStructE, ICE etc



Click publications to read

AECOM report + RICS summit





Environmental Audit Committee

Environmental sustainability and housing growth

Sixth Report of Session 2024–26

HC 439

EAC recommendation – latest inquiry

“

We reiterate and support the recommendation given by our predecessor Committee on embodied carbon and whole-life carbon assessments...We recommend that a clear timeframe for the introduction of mandatory whole-life carbon assessments and ratcheting targets should be set by Government by the end of this year”

July 2026 adjournment debate

“The Government's position is that **embodied carbon in new buildings is important**. The direction of travel is towards better measurement and reduction...Let me be clear about what the Government are not saying. **We are not saying that embodied carbon is too difficult to address, we are not saying the Government will have no role to play**, and we are not saying complexity is a reason to put this issue in the “too hard” box. However, we are saying that complexity matters; unintended consequences matter; burdens on industry, local authorities and consumers matter; housing delivery and building safety matter; and net zero matters. The right policy must hold these objectives together...we are considering the next steps very carefully. Ahead of any potential intervention, we want to understand the impacts on the sector. So **we have commissioned research** to help improve our understanding of the data currently available on embodied carbon, and identify where gaps and challenges lie. We will continue to work with industry, local government, professional bodies, environmental organisations and parliamentarians to consider the right levers for action.”



Read [Hansard](#) or [watch recording](#) of debate

NPPF consultation Government response



Government response to the proposed reforms to the National Planning Policy Framework and other changes to the planning system consultation

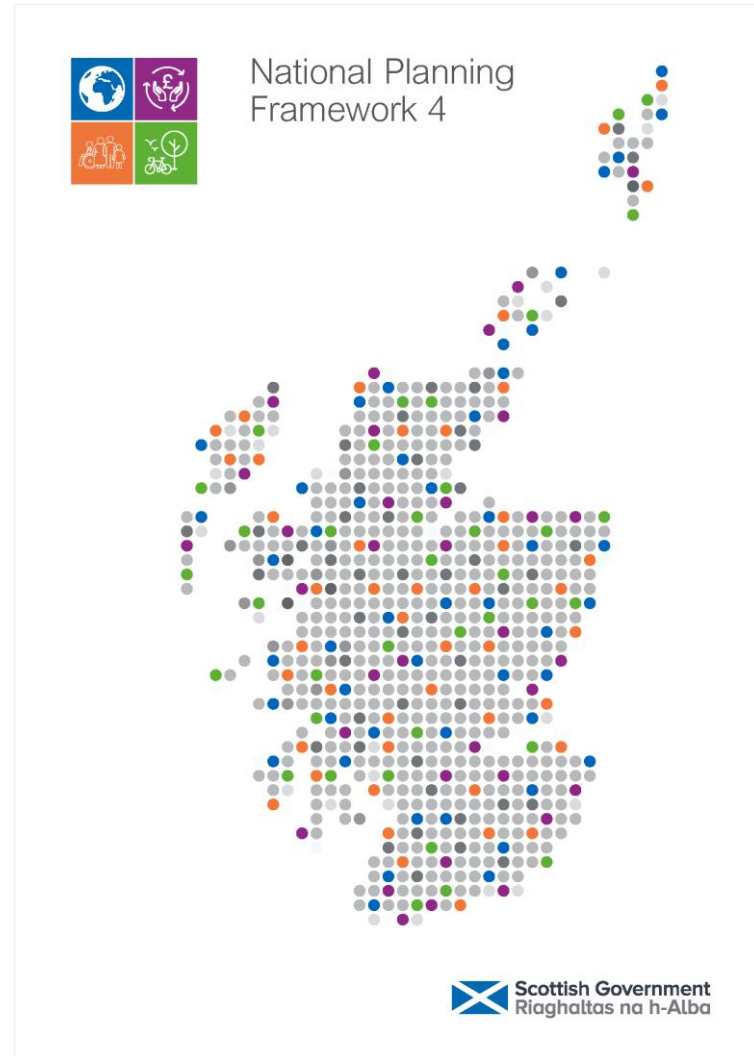
August 2026

- "In relation to carbon assessments...**the government does not consider it proportionate to introduce new mandatory national requirements at this stage**, given the potential burdens, evidence requirements and viability impacts. However, it recognises that such assessments can support plan-making and decision-making when applied appropriately. **Planning Practice Guidance will be updated to support clarity and consistency in their use.**"
- "Many respondents emphasised the role of whole-life carbon assessment..with some advocating mandatory national requirements. Others raised concerns about the proportionality, evidence requirements and viability impacts of such approaches, and the need for clearer guidance and standardised methodologies"...**"the government is not requiring whole-life carbon assessments through planning at the present time (which this does not preclude assessments being used for specific schemes where appropriate)."**

INSIGHTS FOR SCOTLAND

For NPF4 & beyond

NPF4 Policy 2



“

Development proposals will be sited and designed to minimise lifecycle greenhouse gas emissions as far as possible”

NPF4 Policy 2 Guidance

NPF4 Planning Guidance

Policy 2 - Climate Mitigation and Adaptation

June 2025



- Stresses need for proportionate approach with initiation at earliest design stages
- Suggests quantitative assessments for most projects (except changes of use, householder developments, proposals <10 residential units & non-residential <1000m² - suggests qualitative statement for those)
- Links to many widely used standards (e.g. RICS Professional Standard, PAS 2080)

Example – Moray

Moray Council Carbon Guidance for Planning Applications and S36 and S37 consents

Purpose

To support the development management process to determine planning applications against Policy 2 of National Planning Framework 4, which requires that *"development proposals will be sited and designed to minimise lifecycle greenhouse gas emissions as far as possible" and "development proposals will be sited and designed to adapt to current and future risks from climate change"*.

Threshold

This guidance will apply to:

- residential developments of 10 or more units
- commercial, industrial, retail, leisure, infrastructure developments where floor space is 1,000 square metres or more
- Energy related developments of 5MW or more (including battery storage, grid infrastructure and energy production).

Requirements

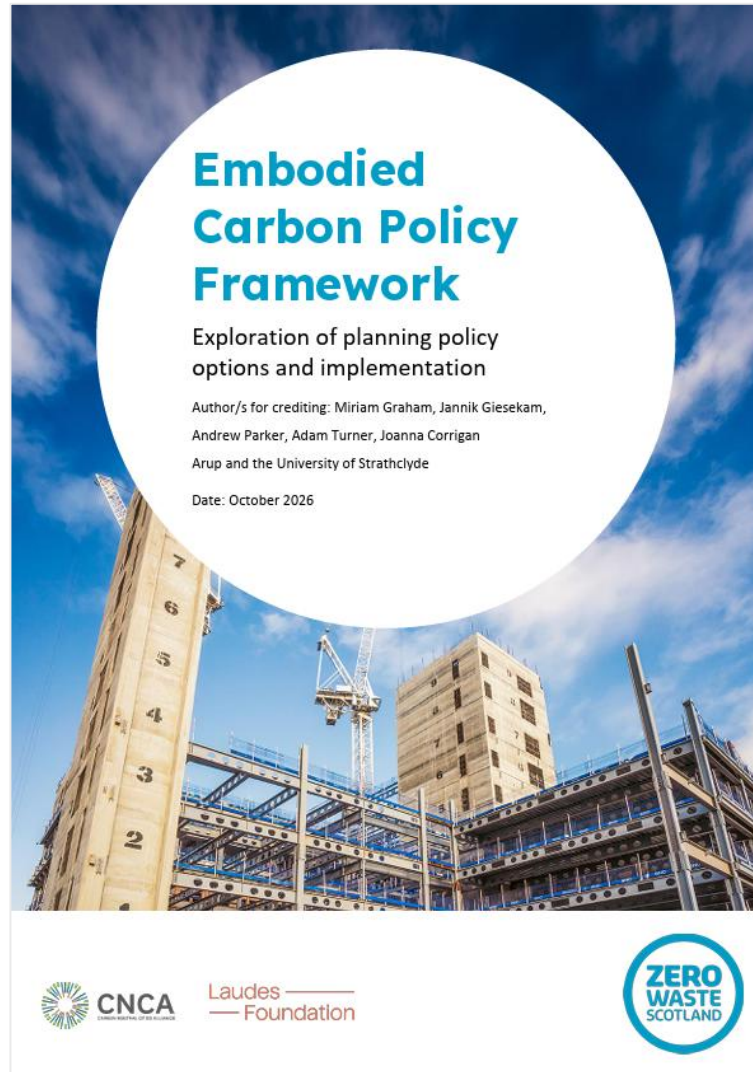
All planning applications within the stated threshold will be required to submit the following information. Submissions should address the questions raised within this guidance, as appropriate to the development:

- **Overview of development and key carbon and climate considerations**
 - Provide a brief overview of the development and the main considerations being given to whole life carbon reduction.
 - How does the development meet the needs of the current climate and future climate scenarios? How is the development designed with future climate risks in mind, or how may it be adapted to suit these changes in the future?
- **Whole life carbon assessment**
 - Which nationally recognised whole life carbon assessment method will be used (e.g. BS EN 15978, with additional guidance from RICS Professional Statement), and why was this method chosen?
 - Where will embodied carbon emissions occur within the proposed development, and how will these be measured and minimised? Provide breakdown of embodied carbon emissions by source and by each stage of the development's life cycle.
 - Where will operational carbon emissions occur within the proposed development, and how will these be measured and minimised through design? Provide a breakdown of operational carbon emissions by source and by development life cycle stage.
 - What does net zero emissions mean in the context of the proposed development and when will it be achieved? How will net zero emissions be achieved on this development, including specific low carbon measures or renewable energy systems that will be implemented?
 - If the proposed development does not achieve net zero emissions, provide an estimate of the annual tonnes of carbon emissions that will require offsetting to achieve net zero (refer to carbon sequestration statement section).

Carbon Guidance

Sets out range of requirements for developments above a threshold including: breakdown of embodied carbon emissions by source and stage, responses to range of questions about method, strategy, carbon management, reporting etc.

New framework report



Includes:

- Literature heatmap
- Outcomes from extensive stakeholder engagement
- Set of building blocks policy options
- Implementation workflows, resource requirements, role descriptions, legal set up, enforcement options etc
- Developer toolbox

Lessons for Scotland from elsewhere

- There is no single perfect policy approach
- Start simple & expand scope over time
- There's value in consistency between jurisdictions
- Sharing best practice is key to rapid learning
- The largest emission reductions will likely be from the first step of requiring widespread assessment

Role for regulation vs voluntary standards

