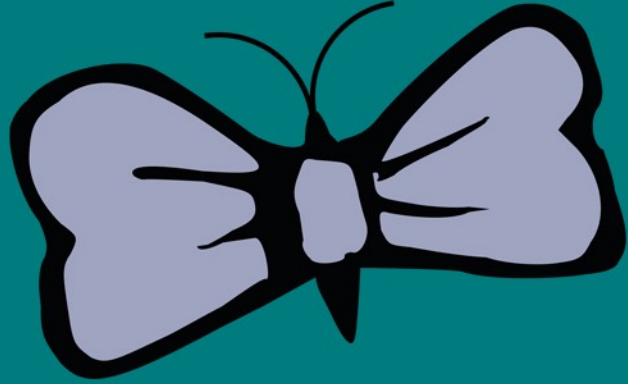




INDICATE WLC Assessments Update

Methodology development and second set of results

Stephen Barrett - IGBC





Henry J Lyons



BDP.



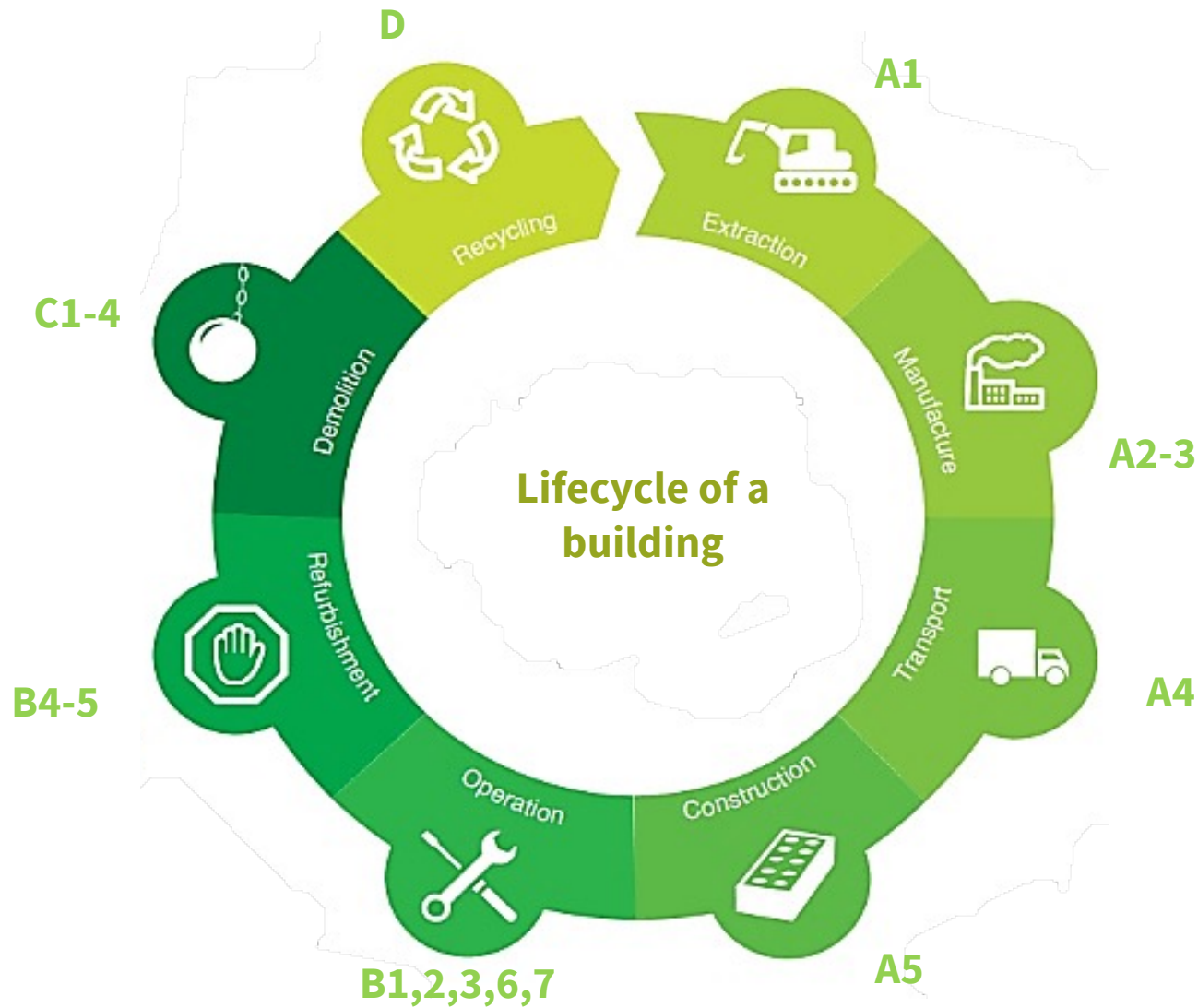
HELENA MCELMEEL
ARCHITECTS

walls



Our Champions!





The EPBD update means the rest of the lifecycle impacts will have to be considered too.

See standard EN-15978 for the lifecycle details

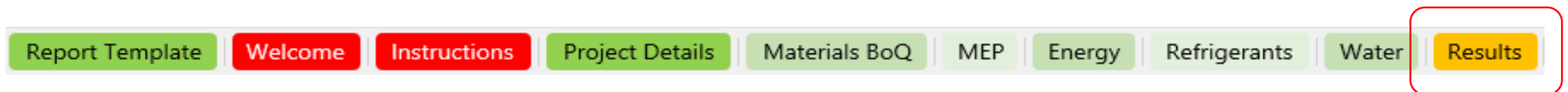
Uses **EU Level(s) indicator 1.2**, GWP across the lifecycle, to inform ;

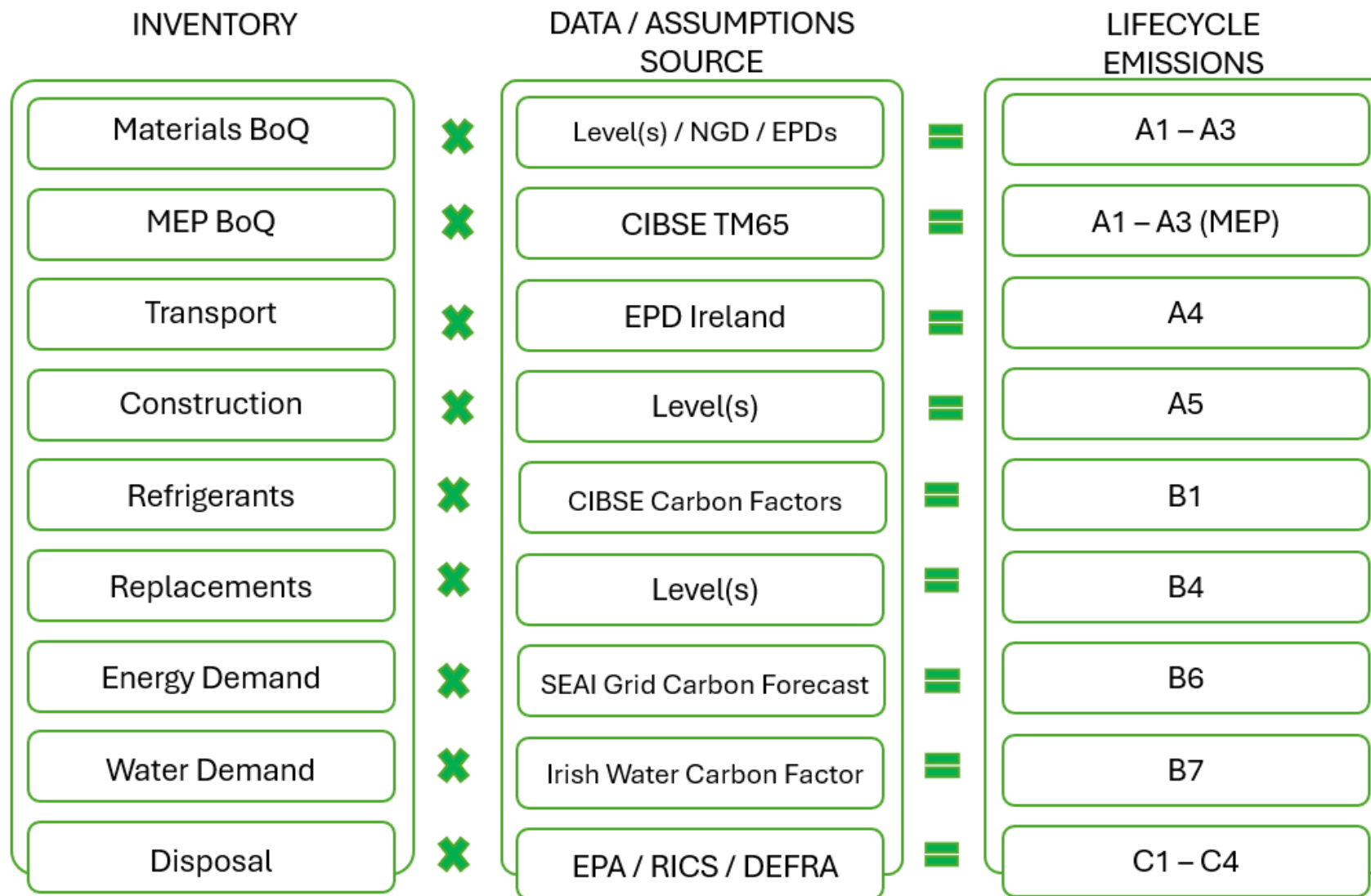
- the scope of what is measured
- the timeframe (50 years)
- assumptions on replacement cycles

Based on the international standard for building level LCA – **EN15978**

- Enter quantities of materials required for each element in your project.
- Use EPDs or pick from the generic list
- Estimate the MEP requirement
- Estimate the energy demand per annum
- Include refrigerants and water data if you have them

A set of assumptions are applied based on the sources mentioned and a result is generated





What have you measured?

The Assessment Scope

	Included in building	Included in assessment		Included in building	Included in assessment		Included in building	Included in assessment
Piles	Yes	Yes	Ceilings finish	Yes	Yes	Drainage system	Yes	Yes
Basements	Yes	Yes	Wall finish	Yes	Yes	Lifts and escalators	Yes	Yes
Retaining walls	Yes	Yes	Floor coverings and finishes	Yes	Yes	Firefighting installations	Yes	Yes
Frame (beams, columns and	Yes	Yes	Drainage system	Yes	Yes	Communication and security installations	Yes	Yes
Upper floors	Yes	Yes	Connections and diversions	Yes	No	Telecoms and data installations	Yes	Yes
External walls	Yes	Yes	Substations and equipment	Yes	Yes	Refrigerants	Yes	Yes
Balconies	Yes	Yes	Paving and other hard surfacing	Yes	Yes	Operational Energy (B6)	Yes	Yes
Ground floor slab	Yes	Yes	Fencing, railings and walls	Yes	Yes	Water usage (excl. heating)	Yes	Yes
Internal walls, partitions and	Yes	Yes	Light fittings	Yes	Yes			
Stairs and ramps	Yes	Yes	Control systems and sensors	Yes	Yes			
External wall systems, cladd	Yes	Yes	Heating plant and distribution	Yes	Yes			
Façade openings (including	Yes	Yes	Cooling plant and distribution	Yes	No			
External render	Yes	No	Electricity generation and distribution	Yes	Yes			
RoofStructure	Yes	Yes	Air handling units	Yes	Yes			
Weatherproofing	Yes	Yes	Ductwork and distribution	Yes	Yes			
Above ground and undergro	Yes	No	Cold water distribution	Yes	Yes			
Sanitary fittings	Yes	Yes	Hot water distribution	Yes	Yes			
Cupboards, wardrobes and	Yes	Yes	Water treatment systems	Yes	No			

Completeness:

89%

Report Template

Welcome

Instructions

Project Details

Materials BoQ

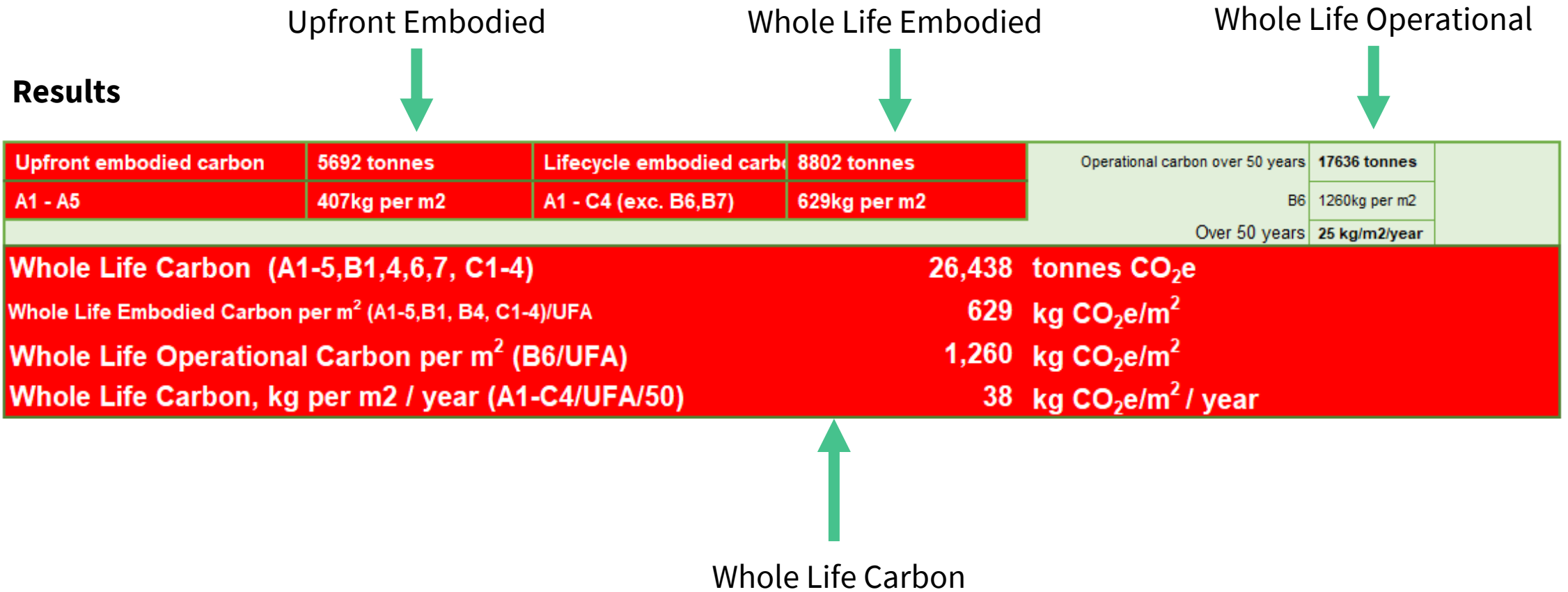
MEP

Energy

Refrigerants

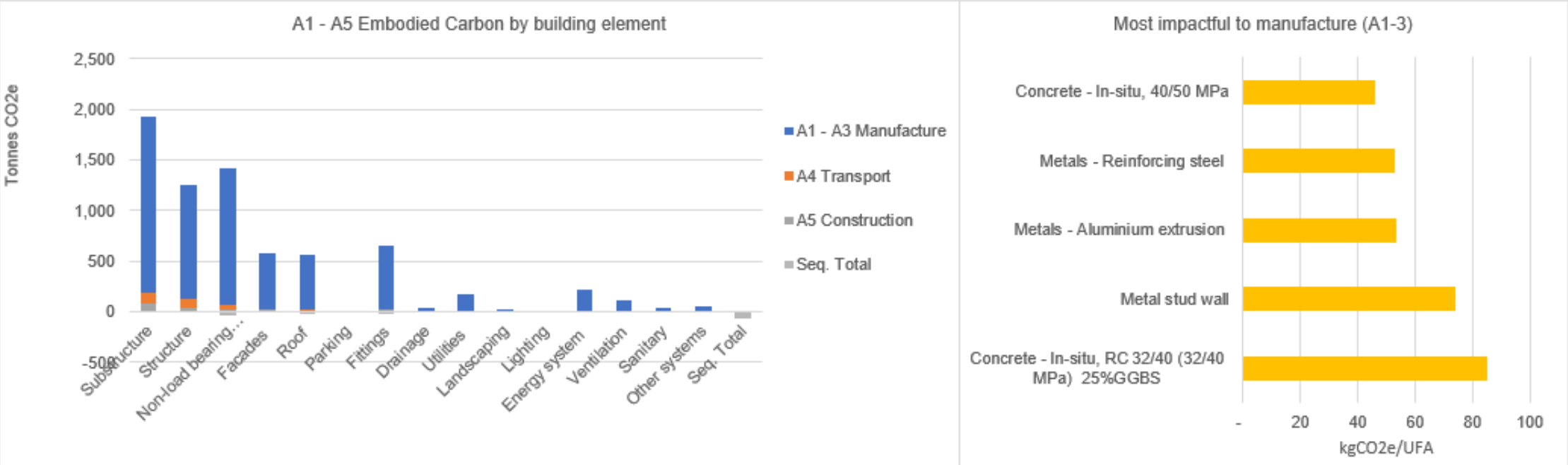
Water

Results



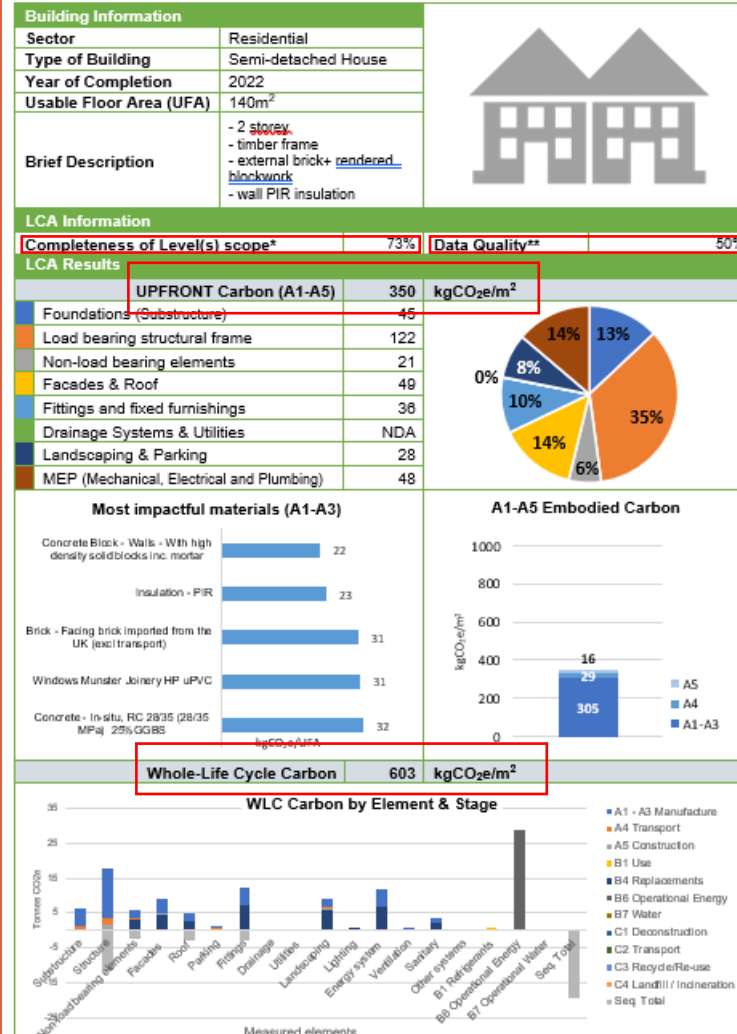
Where are the biggest impacts?

Completeness of Level(s) Scope	89%	See bottom of page 1 for scope inclusions and omissions
Data Quality	53%	Data can be from EPDs or generic estimates. EPD data will provide the more accurate result for Embodied Carbon



Draft Template report for GWP Rating Scheme

SEMI D - BRICK



* The scope of the assessment is defined in Table 4 of [EN 15978:2012](#). An assessment should reach 100% when fully costed and all material quantities are assessed. This % score gives an indication of how much of the scope is still outstanding.

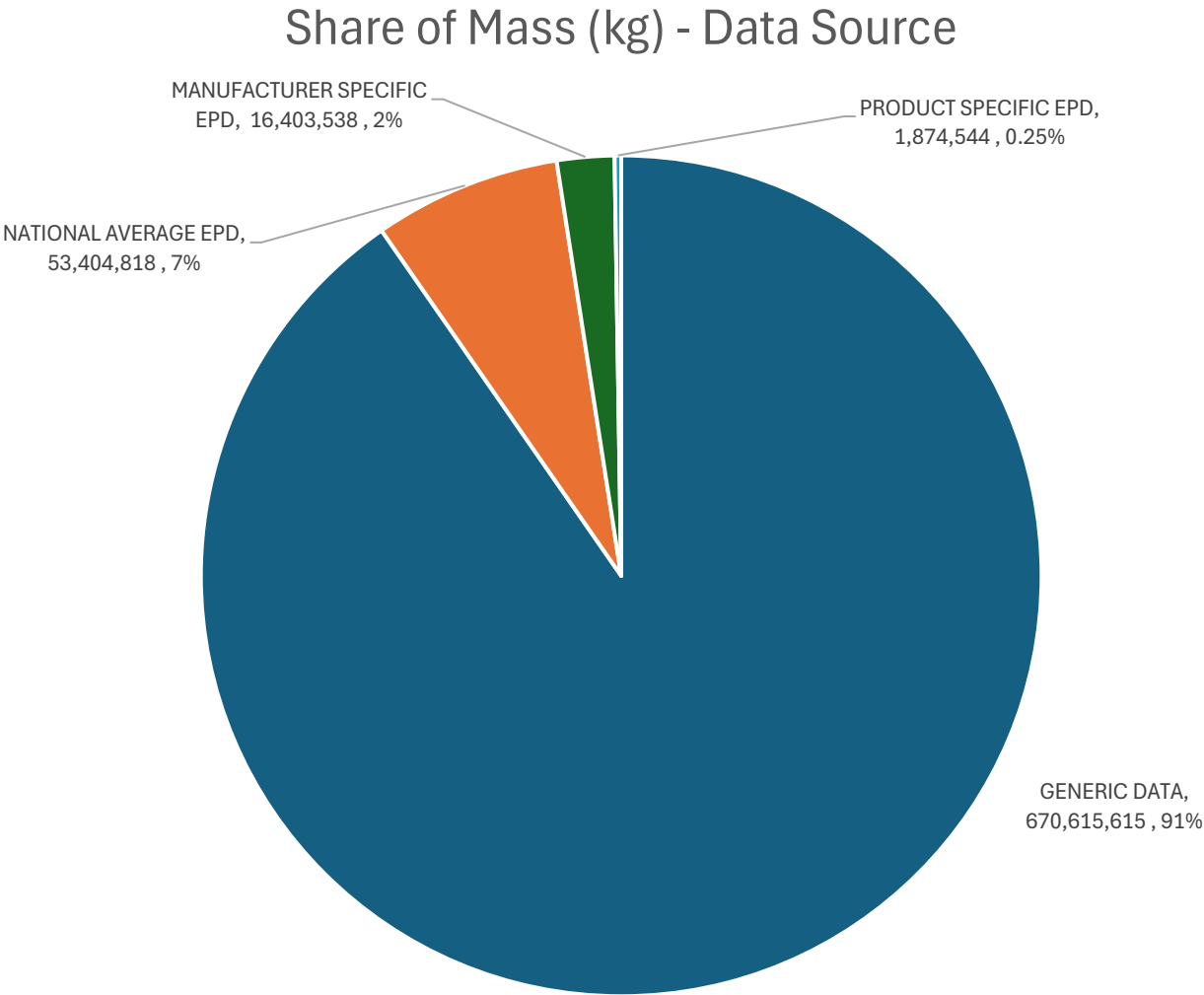
** The Data Quality score indicates the proportion of the building mass assessed using EPDs, the best quality information available, and the proportion assessed using generic estimate data. It is an indication of the confidence level of the assessment. Using EPDs, particularly for high mass elements such as concrete and steel will increase the confidence score.

NDA: No data available.

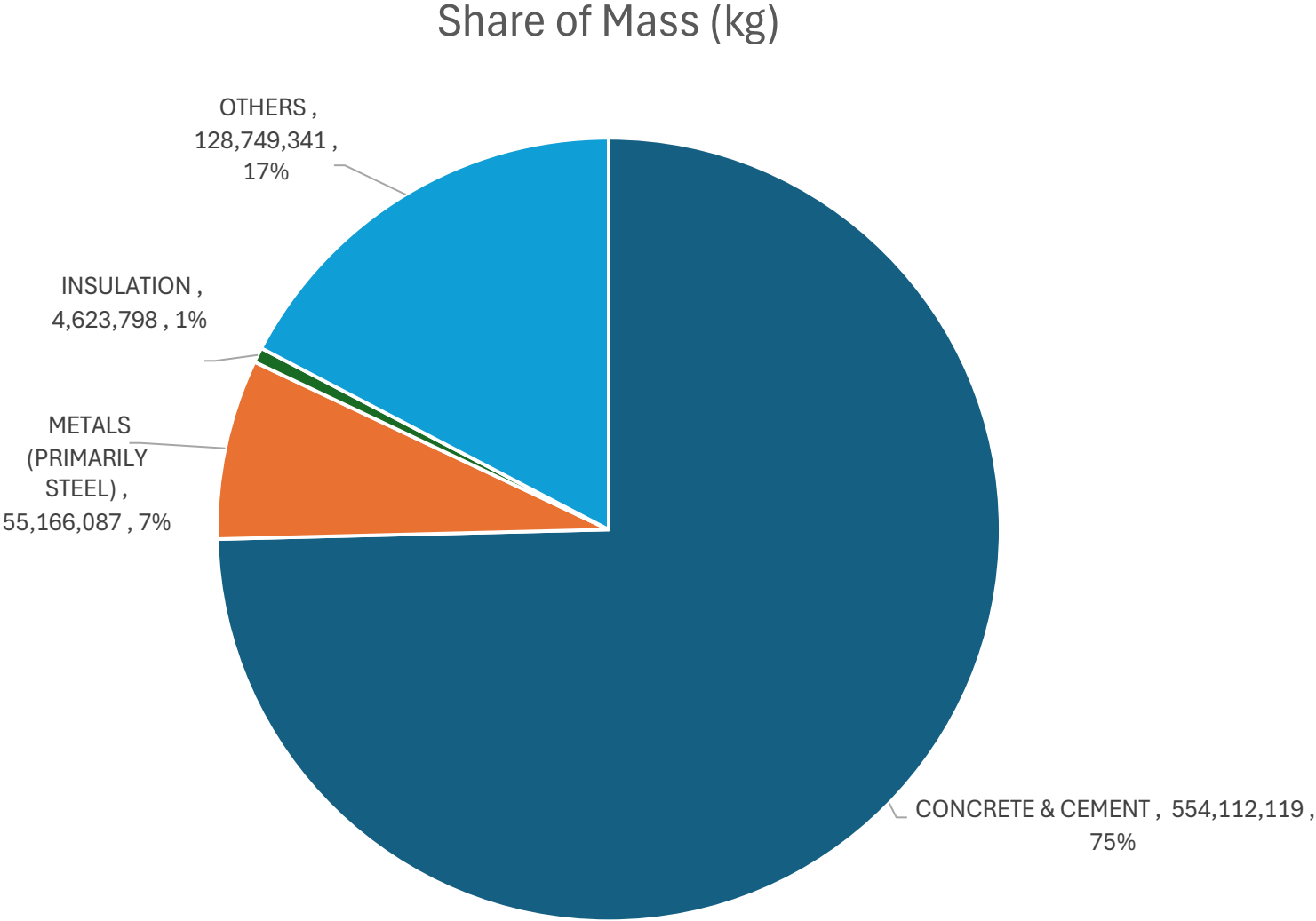
Future Regulation?

The Data

Total = 742,651.3 tonnes of stuff!

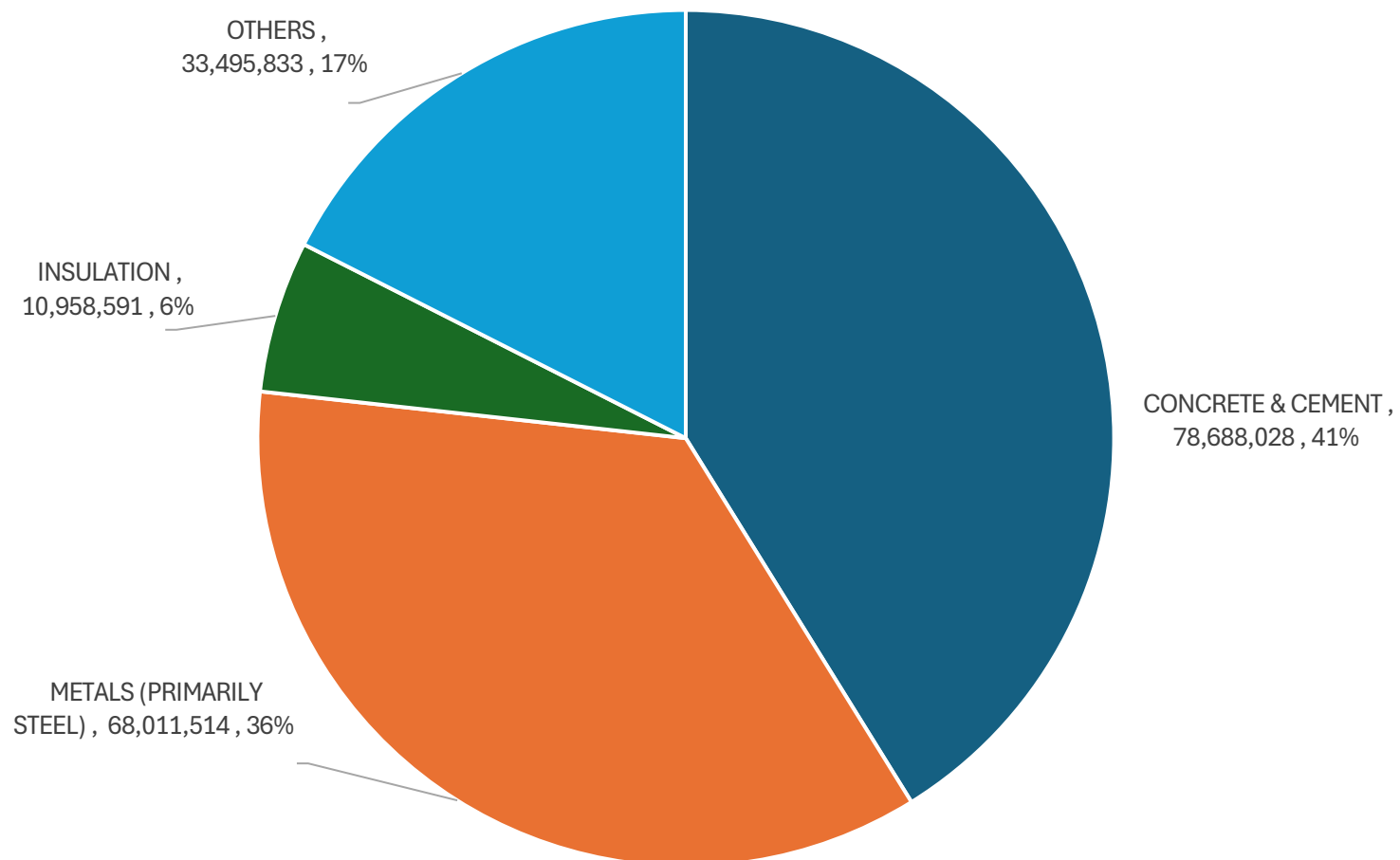


Total = 742,651.3 tonnes of stuff!



Total = 191,153.9 tonnes of CO₂e

Share of A1-3 manufacturing emissions (kgCO₂e)

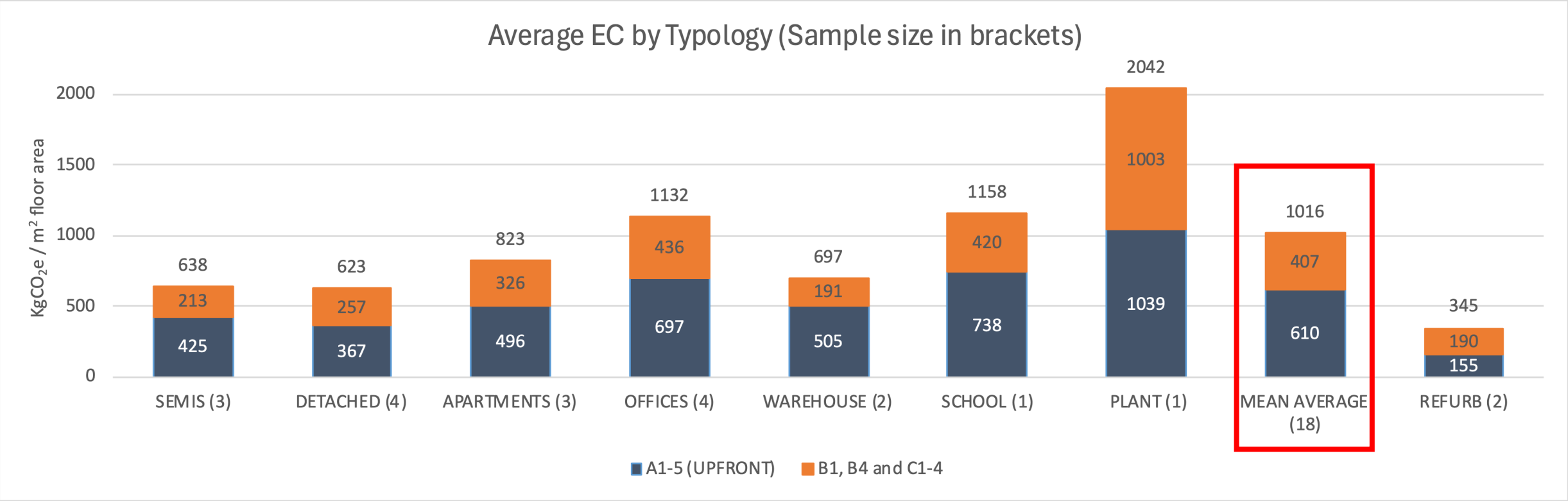


...but the steel is almost as impactful...

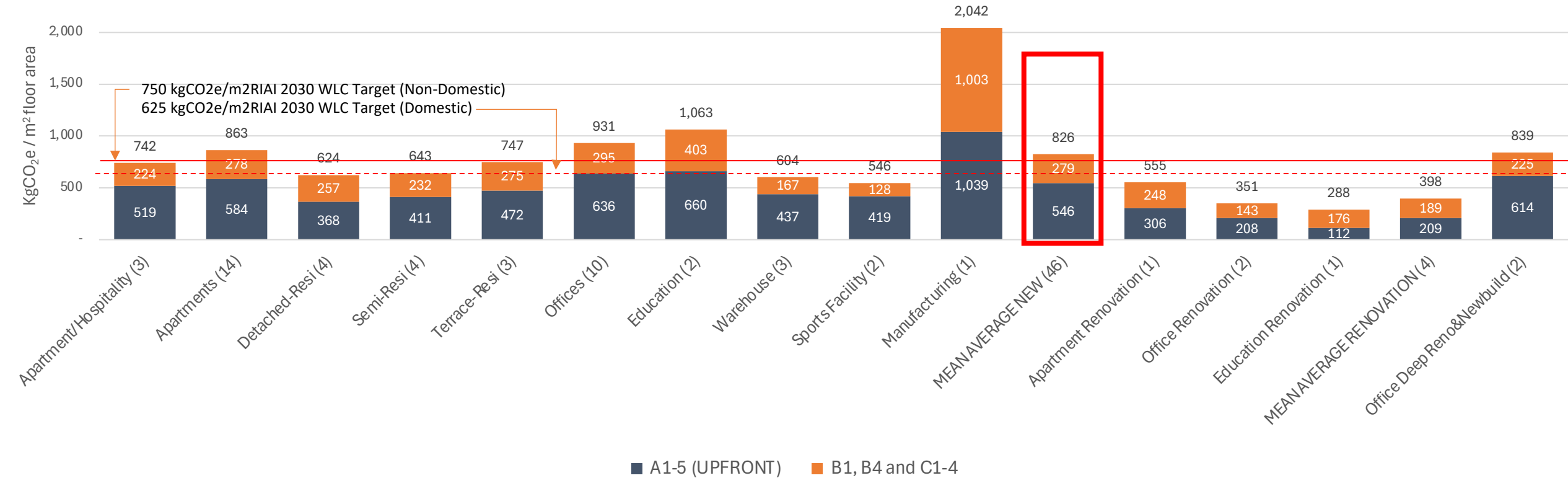
Total = 191,153.9 tonnes of CO₂e

	Kg Mass	KgCO ₂ e	Ave. CO ₂ per kg	Equivalent to Car kilometres (per kg)
CONCRETE (& CEMENT)	554,112,119	78,688,028	0.142	1
METALS (PRIMARILY STEEL)	55,166,087	68,011,514	1.233	9
INSULATION	4,623,798	10,958,591	2.370	17
OTHERS	128,749,341	33,495,833	0.260	2
TOTAL	742,651,345	191,153,967	0.257	2

What about typologies?

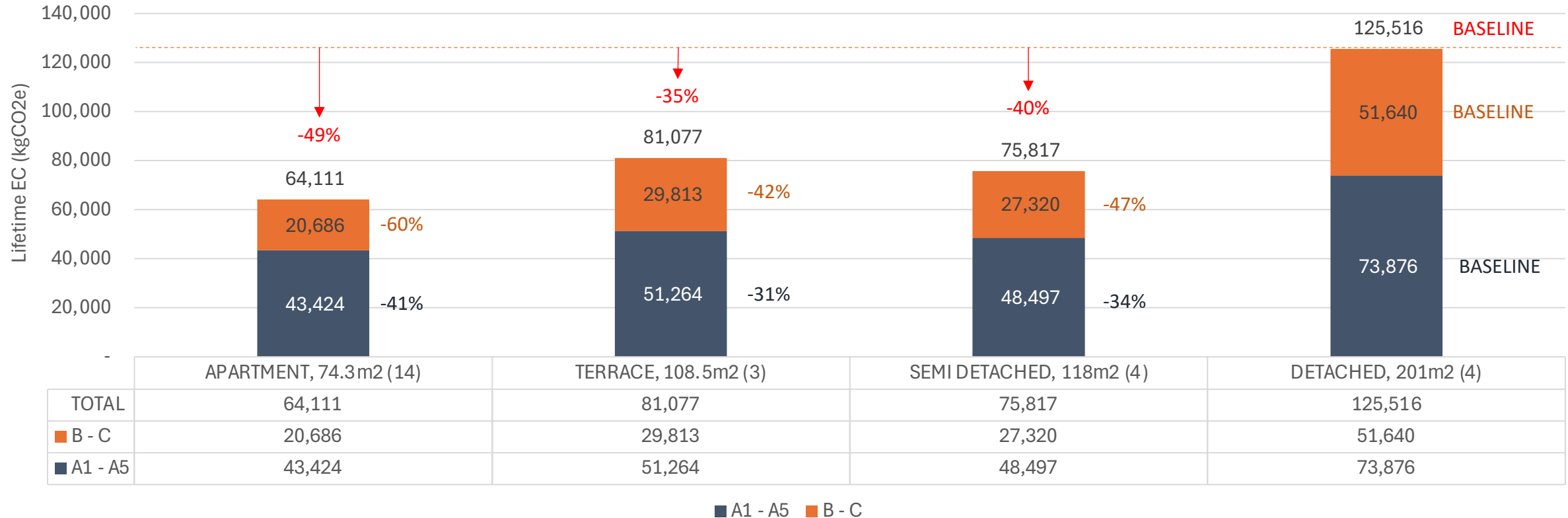


Average EC by Typology (Sample size in brackets)



DWELLING TYPE	FLOORAREA	TOTALS PER DWELLING		A1 - A5	B - C	TOTAL
		A1 - 5	B-C			
APARTMENT, 74.3m ² (14)	74	584	278	43,424	20,686	64,111
TERRACE, 108.5m ² (3)	109	472	275	51,264	29,813	81,077
SEMI DETACHED, 118m ² (4)	118	411	232	48,497	27,320	75,817
DETACHED, 201m ² (4)	201	368	257	73,876	51,640	125,516

Average Total EC by dwelling type



Per sq. metre can be a dangerous metric: Typical Residential Comparison

What have you measured?

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External walls	Yes	Yes	Substations and equipment	Yes	Yes	Refrigerants	Yes	Yes
Balconies	Yes	Yes	Paving and other hard surfacing	Yes	Yes	Operational Energy (B6)	Yes	Yes
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External render	Yes	No	Electricity generation and distribution	Yes	Yes			
RoofStructure	Yes	Yes	Air handling units	Yes	Yes			
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Sanitary fittings	Yes	Yes	Hot water distribution	Yes	Yes			
Cupboards, wardrobes and	Yes	Yes	Water treatment systems	Yes	No			

Completeness:

89%

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MEP

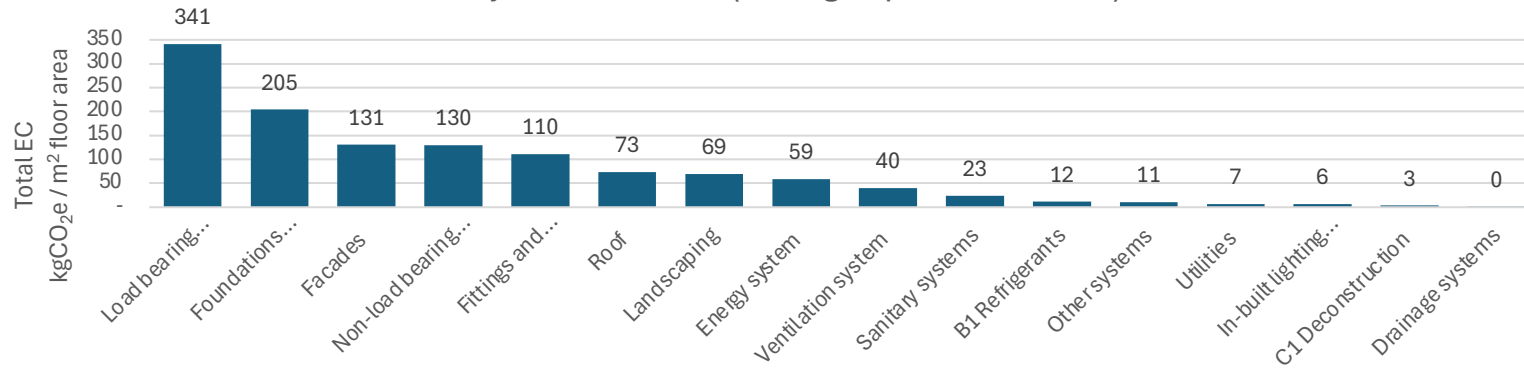
Energy

Refrigerants

Water

Results

EC by Tier 1 Element (Average Apartment Block)

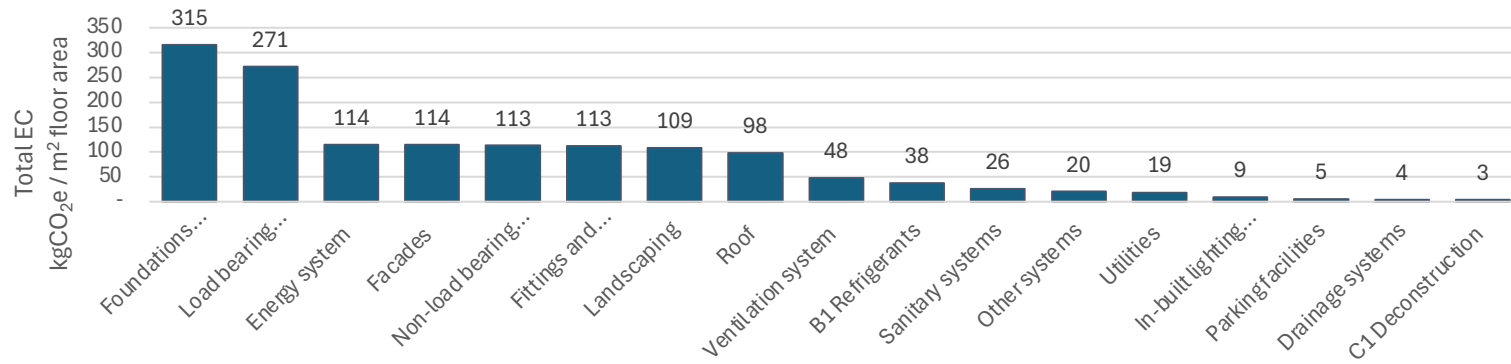


Building Av. 863kgCO₂e/m²

Sum: 1,222 per m² (+29%)

Sample size: 14

EC by Tier 1 Element (Average Office Block)

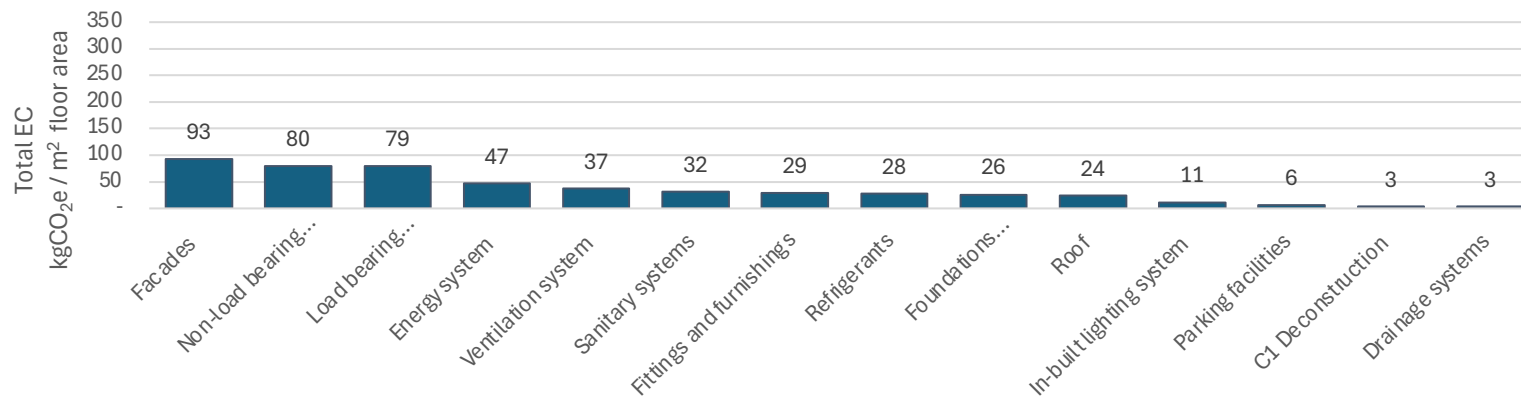


Building Av. 931kgCO₂e/m²

Sum: 1,418 per m² (+34%)

Sample size: 10

EC by Tier 1 Element (Renovation)

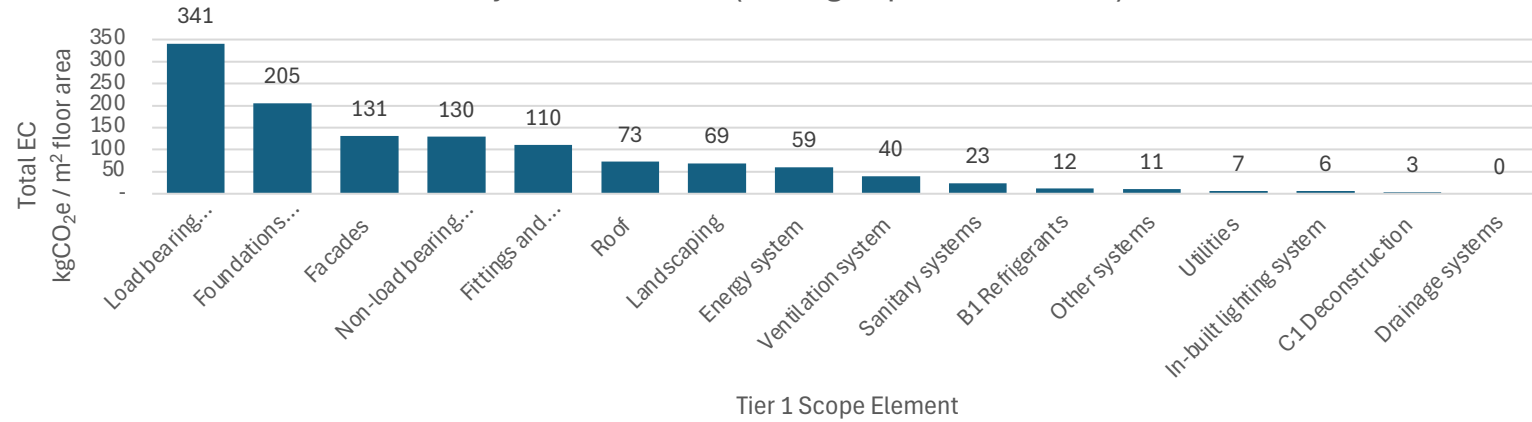


Reno Av. 398kgCO₂e/m²

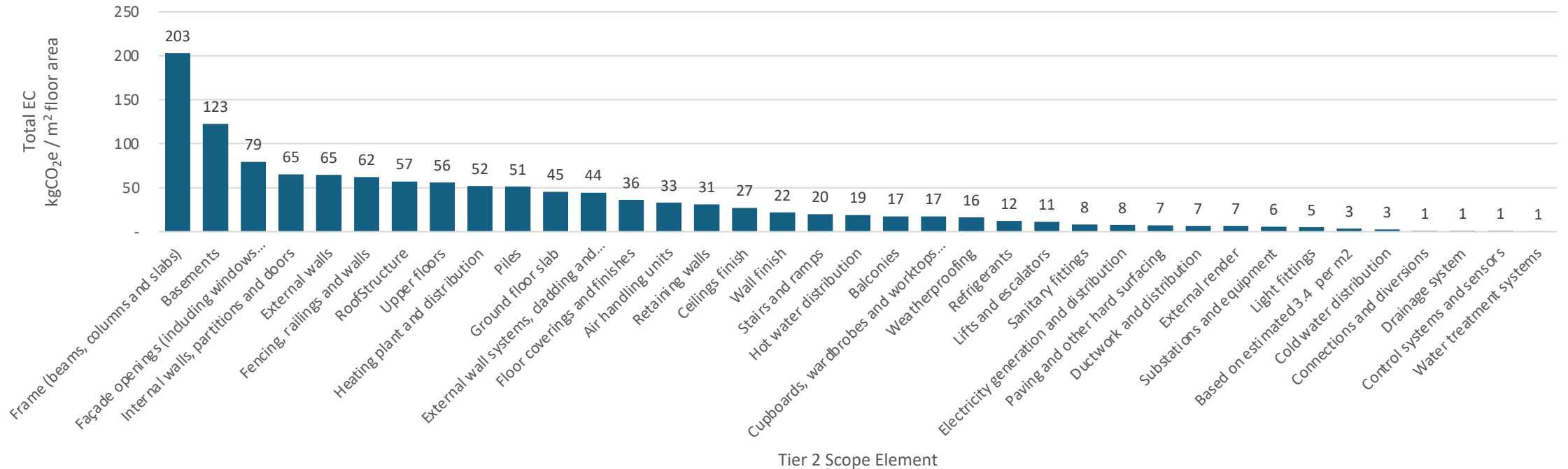
Sum: 498 per m² (???)

Sample size: 4

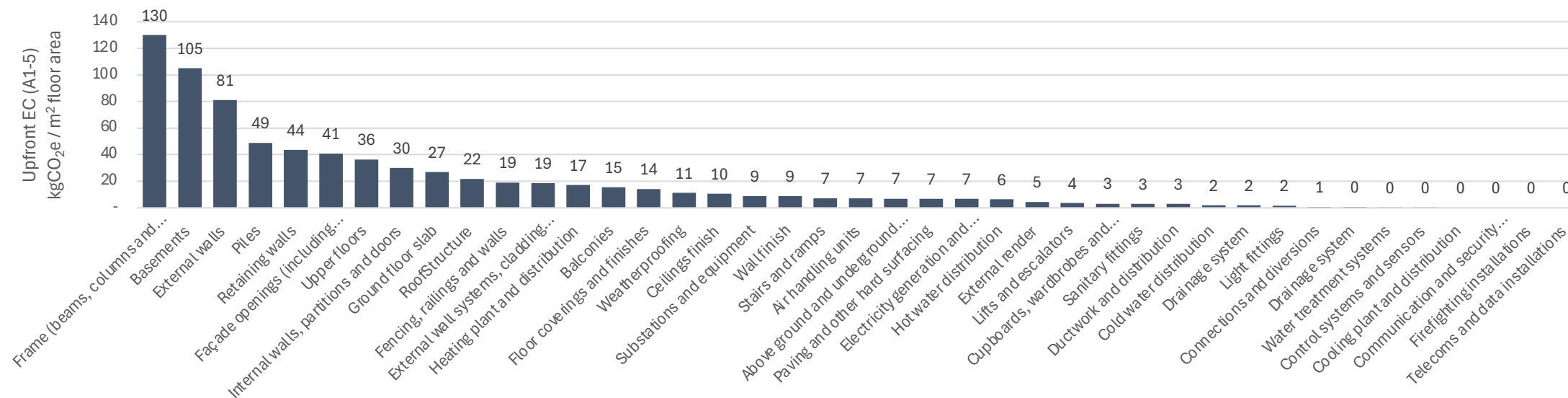
EC by Tier 1 Element (Average Apartment Block)



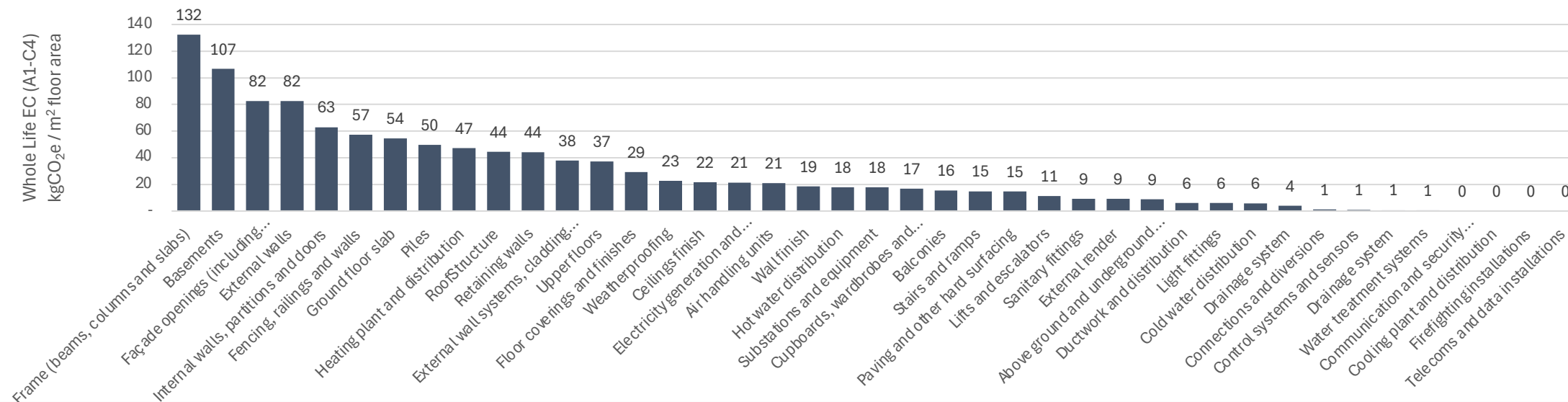
EC by Tier 2 Element (Average Apartment Block)



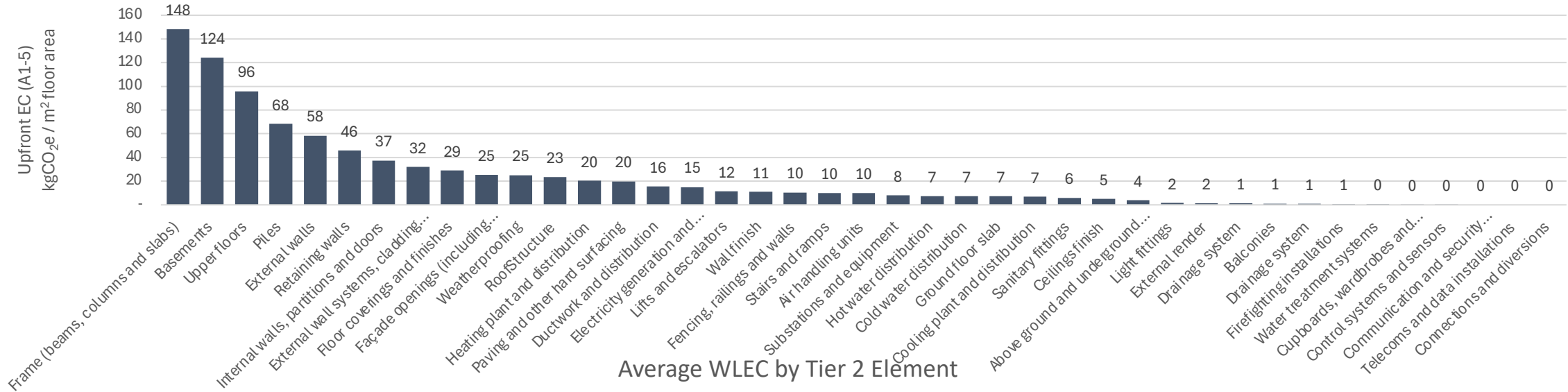
Average Upfront EC by Tier 2 Element (A1-A5)



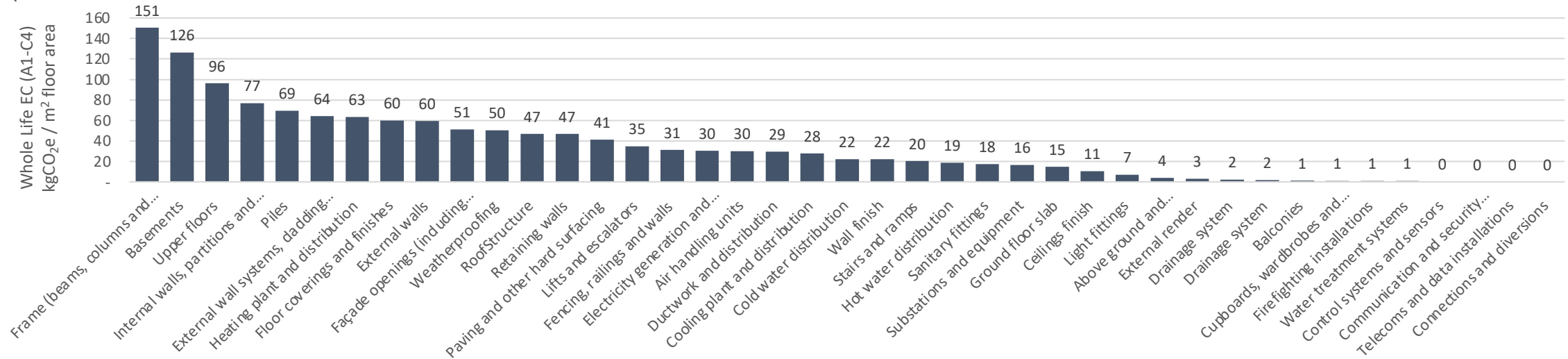
Average WLEC by Tier 2 Element (A1-C4)



Average Upfront EC by Tier 2 Element



Average WLEC by Tier 2 Element



Where next?

<https://www.rics.org/profession-standards/rics-standards-and-guidance/sector-standards/construction-standards/icms3>

In Ireland the International Cost Management Standards (ICMS3) cost and carbon reporting templates are mandated for use in public procurement from the 1st January 2024. The Society of Chartered Surveyors Ireland has released a free suite of explanatory and guidance material.

<https://scsi.ie/ipms-icms>

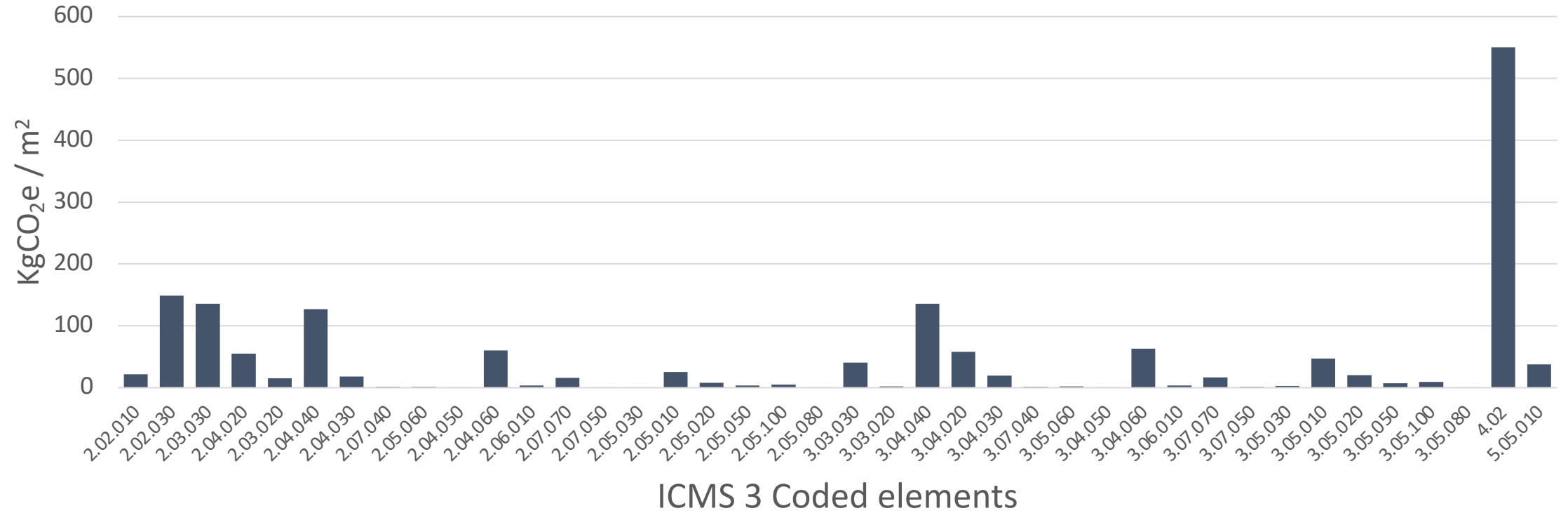
With the built environment responsible for around 40% of the global carbon emissions, it is crucial that leaders have clear comparable data to achieve carbon and cost targets. The ICMS Coalition of 49 globally-prominent organisations has developed ICMS 3 – a world first for cost and carbon management in infrastructure.

ICMS 3 will contribute positively to efforts to decarbonise the construction sector in the most cost-effective way. **Through ICMS 3, professionals will for the first time be empowered to deliver a globally consistent method for carbon life cycle reporting across construction projects, from buildings and bridges to ports and offshore structures.**

By providing a common reporting framework for life cycle costs and carbon emissions, ICMS allows their interrelationship to be explored, and provides the opportunity to make decisions about the design, construction, operation and maintenance of the built environment to improve environmental sustainability

<https://scsi.ie/ipms-icms>

ICMS Coded Result Chart Example



Ramboll launches open access carbon database for buildings

Ramboll's carbon assessment database, CO2mpare, allows industry and governments to explore and compare data for carbon emissions across more than 200 building carbon assessments.

<https://www.ramboll.com/co2mpare>



Built Environment Carbon Database

The Built Environment Carbon Database is an initiative led by a consortium of UK professional bodies and organisations: BRE, CIBSE, CIC, CIOB, ICE, IStructE, RIBA, RICS, the Carbon Trust and UK GBC. Its objective is to align reporting practices and bring together existing data in a single location which is free to access, easy to use, and can act as the main UK platform to store carbon assessments and generate carbon benchmarks.

<https://www.becd.co.uk>

- Can we make the most impactful elements mandatory? Others can wait for education to catch up.
- Can we add in assumptions for missing elements to bring an assessment up to 'completion'?
- How can we improve building services data?
- How do we reward the use of EPDs? Disincentivise generic data? Safety margin for poorer data?
- Storage of (periodically reviewed) generic background data for assessments
- Storage of results/performance
- Training & Awareness