



# Shading for housing

Embodied carbon of shading products

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# Embodied carbon

This document illustrates the embodied carbon analysis of some of the shading products presented in the shading guide.

The operational carbon reduction in mechanically cooled buildings where shading products are installed has previously been reviewed by the National Energy Foundation in their 2016 report 'Solar Shading impact'. It demonstrated savings from 7% to 16% when internal shading is used, and 30-33% when external shading is used.

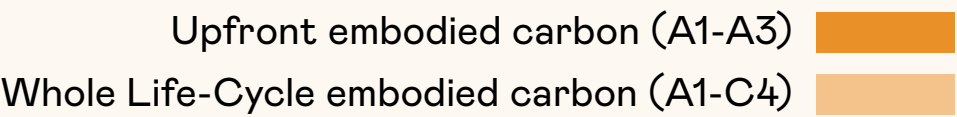
This shows overall savings in carbon emissions when compared with an impact of 1-2% of the total whole life-cycle embodied carbon emissions in a building arising from external shading devices. To quantify the balance of embodied carbon, the shading impact on site-specific projects with and without mechanical cooling, is required.

The results from this assessment shows that the embodied carbon of shading products is small compared to the total embodied carbon of a typical new build. Furthermore, shading products can make significant reductions in cooling and ventilation loads and in associated operational and embodied carbon emissions.

# Embodied carbon

Embodied carbon per declared unit of product (m²). Embodied Life-cycle carbon impact has been calculated using 60 years building reference. Data based on market EPDs.

The durability and maintenance of products has been accounted for within their lifecycle, in most cases the projected life-span is 25 years. This means the same product would be replaced twice in a building with a life-span of 60 years.

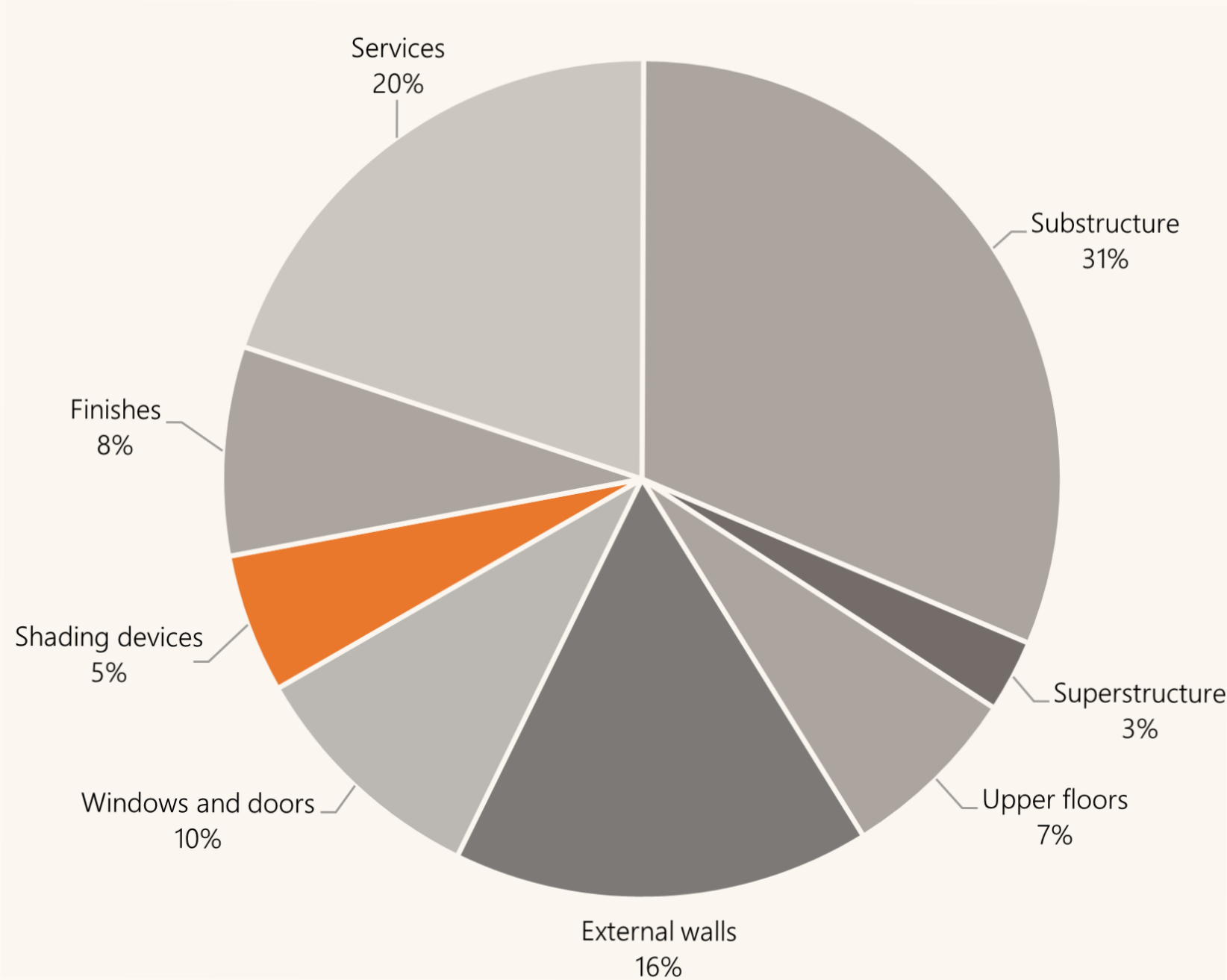


Product type per 1m²	Manufacturer/Product	Description	Material	Upfront embodied (A1-A3)	Whole Life Cycle Embodied (A1-C4)	Embodied carbon Impact of product
1. Overhang	Gover/Urban Gaden	0.70m Brise-soleis	90% aluminium	117 kgCO <sub>2</sub> e/m²	350 kgCO <sub>2</sub> e/m²	<div><div></div><div></div></div>
2. Horizontal slats	Alumil/Smartia M5600	Fixed or motorised louvres	99.5% aluminium	194 kgCO <sub>2</sub> e/m²	Unknown	<div><div></div><div></div></div>
4. Fixed screens	Valcan/VitraDual	Aluminium rainscreen	90% aluminium	85 kgCO <sub>2</sub> e/m²	92 kgCO <sub>2</sub> e/m²	<div><div></div><div></div></div>
5. External sliding shutters	Griesser	Wooden sliding shutter	60% aluminium / 38% wood	144.08 kgCO <sub>2</sub> e/m²	490 kgCO <sub>2</sub> e/m²	<div><div></div><div></div></div>
8. External venetian blinds	Griesser/Lamisol	Motorised	30% aluminium / 30% motor 20% steel / 16% plastics	41 kgCO <sub>2</sub> e/m²	120 kgCO <sub>2</sub> e/m²	<div><div></div><div></div></div>
	Roma (Germany)	Motorised	84% aluminium / 10% plastics	75 kgCO <sub>2</sub> e/m²	230 kgCO <sub>2</sub> e/m²	<div><div></div><div></div></div>
9. External roller blinds	Griesser/Solozip	Manual	36% aluminium / 22% steel 18% sand / 6.14% fabric	49 kgCO <sub>2</sub> e/m²	150 kgCO <sub>2</sub> e/m²	<div><div></div><div></div></div>
10. External roller shutters	Bubendorff/Tradi ID3	Motorised	56% aluminium / 11% steel 11% plastic	50.07 kgCO <sub>2</sub> e/m²	150 kgCO <sub>2</sub> e/m²	<div><div></div><div></div></div>
	Pinto	PVC roller shutter	68% PVC / 18% resin	22 kgCO <sub>2</sub> e/m²	67 kgCO <sub>2</sub> e/m²	<div><div></div><div></div></div>
14. Internal roller blinds	Generic product (Actibaie)	Manual	aluminium / PVC fabric	39.5 kgCO <sub>2</sub> e/m²	230 kgCO <sub>2</sub> e/m²	<div><div></div><div></div></div>
	Generic product (Actibaie)	Motorised	aluminium / PVC fabric	77 kgCO <sub>2</sub> e/m²	Unknown	<div><div></div><div></div></div>
15. Internal venetian blinds	Generic product (Actibaie)		90% aluminium	38 kgCO <sub>2</sub> e/m2	110 kgCO <sub>2</sub> e/m²	<div><div></div><div></div></div>

# Embodied carbon

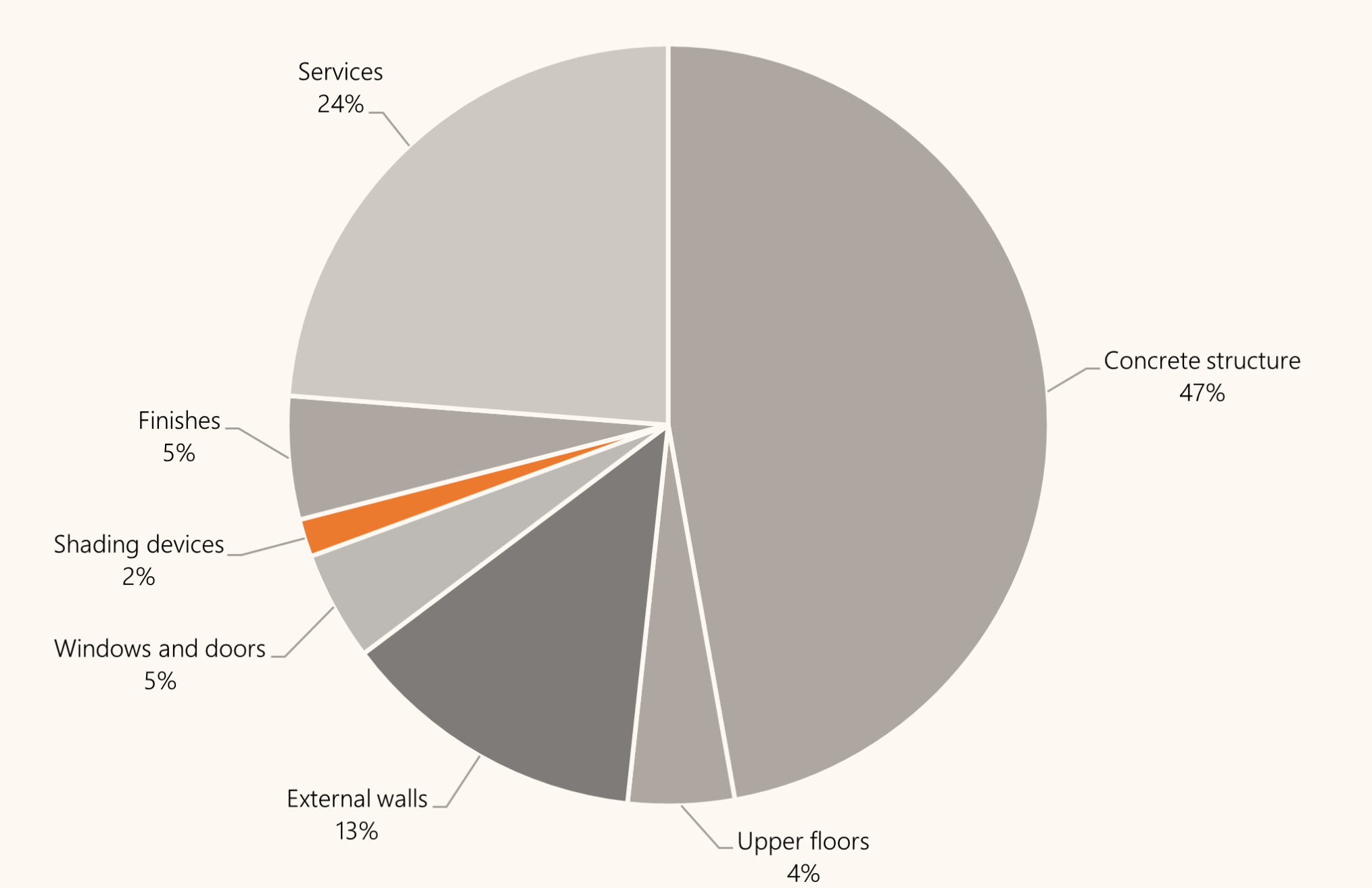
## Two storey house - 50% of windows with shading devices

WLC Embodied carbon for 94m<sup>2</sup> house : 554 kgCO<sub>2</sub>e/m<sup>2</sup> (52 tonnes)  
WLC Embodied carbon of External venetian blind : 1.6 tonnes



## High rise residential - 50% of windows with shading devices

WLC Embodied carbon for 20,000m<sup>2</sup>: 19M tonnes (950 kgCO<sub>2</sub>e/m<sup>2</sup>)  
WLC Embodied carbon of External venetian blind : 607 tonnes



- Notes:
- The embodied carbon assessment has been produced using the approved method of EN 15978:2011
  - The study period is 60 years
  - One Click LCA software was used