

Multi-stakeholder delivery of embodied carbon reduction

ISCN Webinar

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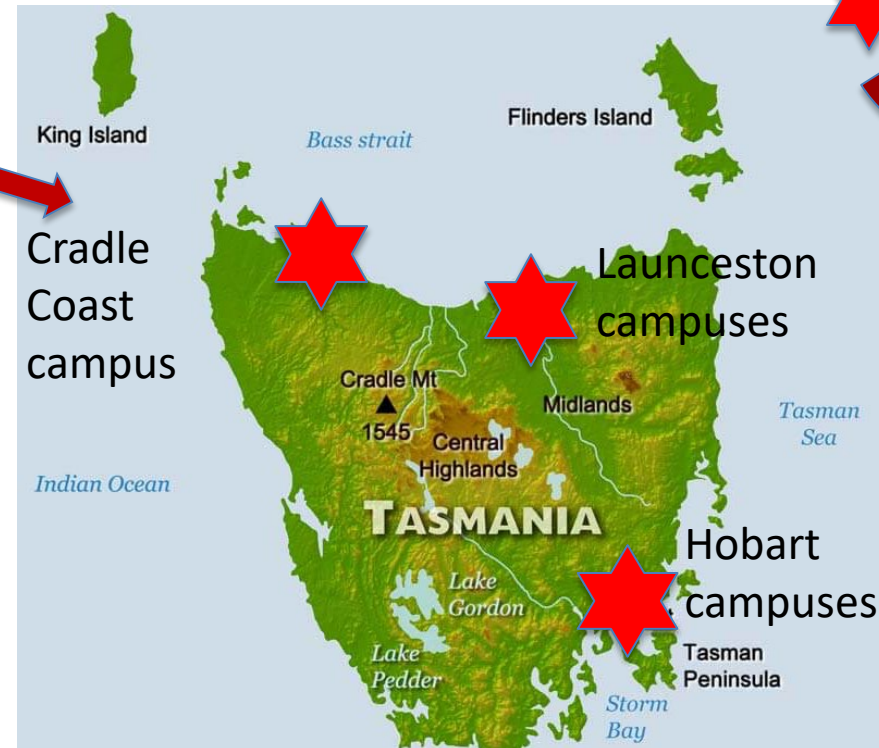


**Acknowledgment
of Country**

The University of Tasmania is the only university on the island state of Australia



- ~30,000 students
- ~2,400 FTE staff
- 132 years old
- 4th oldest Australian university



Sydney
campus

Sustainability under Down Under

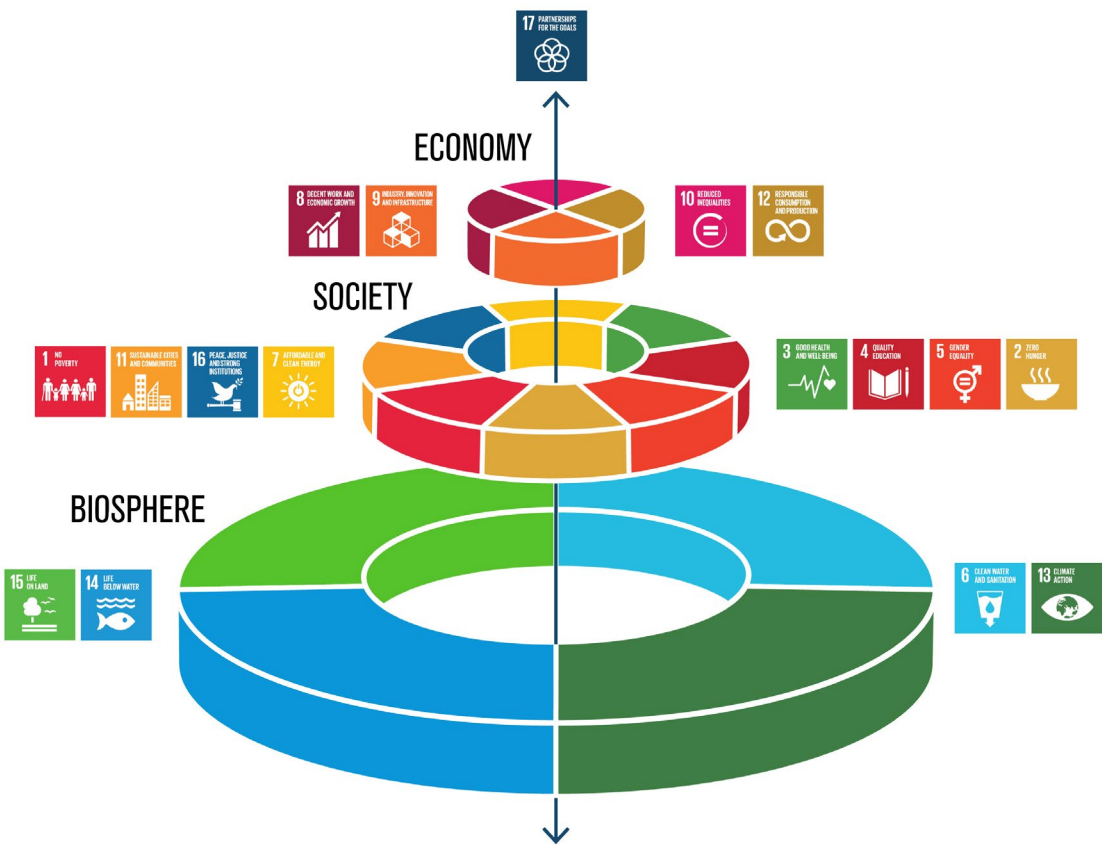
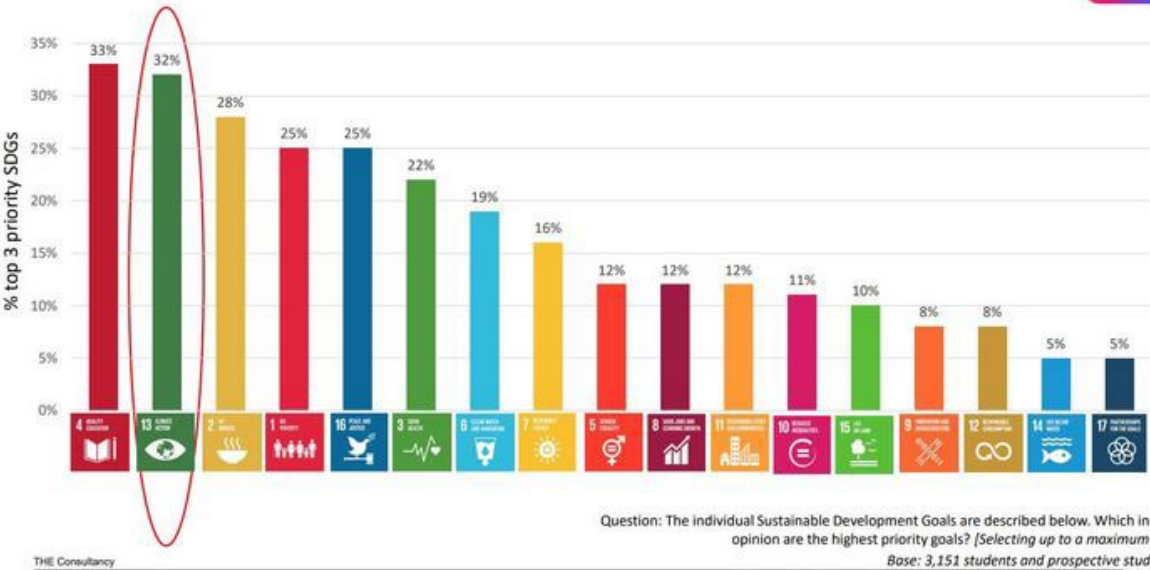


The Sustainable Development Goals (SDGs) inform our holistic sustainability approach and strengthened through a contextual lens to Tasmania and our university that includes a First Nations people focus

The concept of sustainability is composed of three nested and interdependent elements: **environmental, socio-cultural and economic/financial.**

We use the 'Our Common Future' definition where *'sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs.'*

Highest priority SDGs for students



Source: Adapted from the Stockholm Sustainability Institute

Our University ranked #1 globally on Climate Action in both 2022 and 2023 Times Higher Education Impact Rankings, along with increasing to #5 overall in 2023

Global Rank	Top Australian Universities
1	Western Sydney University
5	University of Tasmania
=7	RMIT University
=14	University of Technology Sydney
=18	UNSW Sydney
21	Monash University
28	University of Newcastle
=29	University of the Sunshine Coast
39	Macquarie University
57	La Trobe University
=61	University of Wollongong
=72	Griffith University
=74	Central Queensland University
=79	Charles Sturt University
=92	University of Canberra

↑
We have improved from 25 in 2022

Example drivers of improvement:

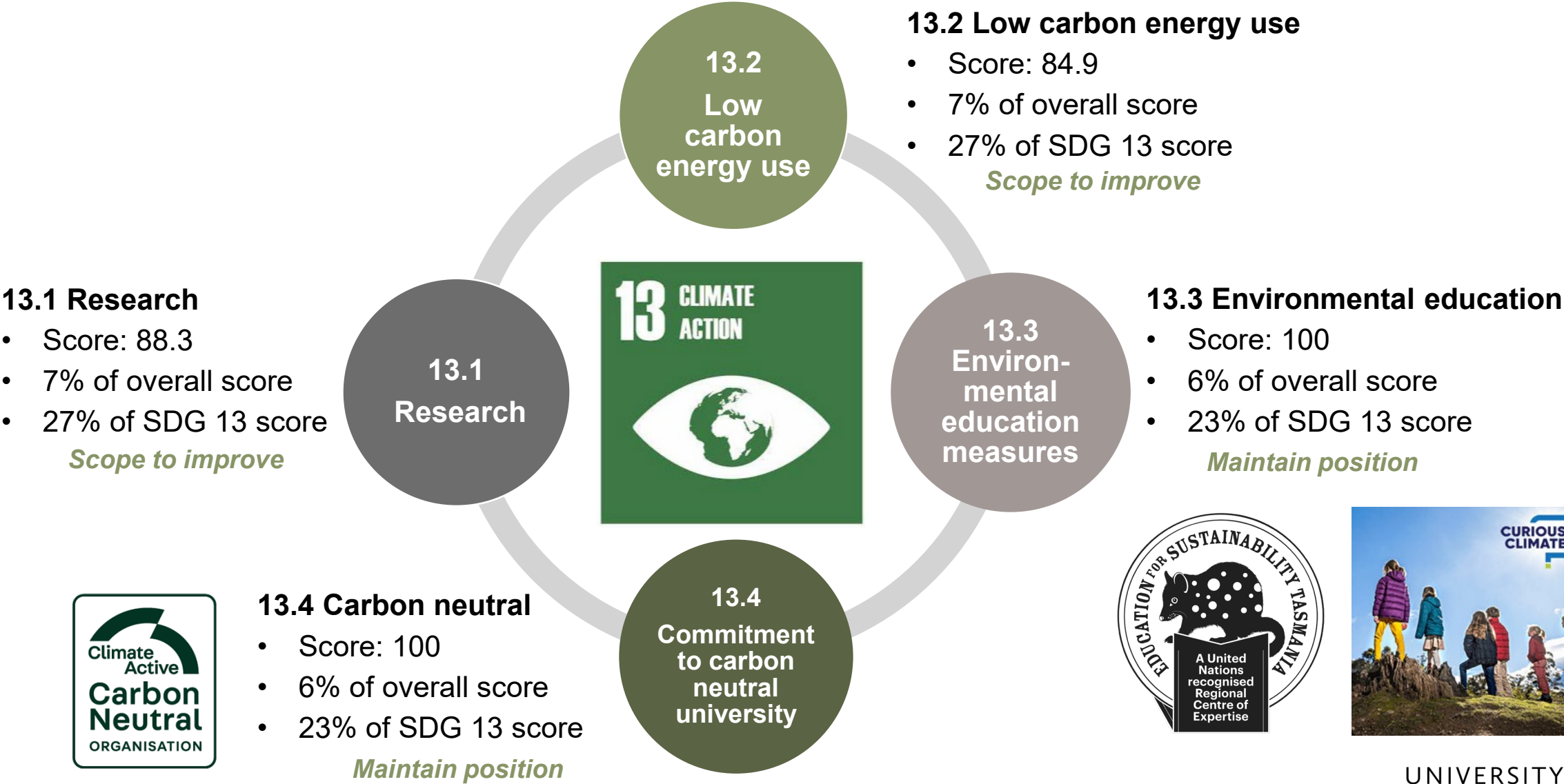
- SDG13 Climate Action – ranked #1 that recognises our **certified carbon neutral** status, community **engagement, research**, and measurement of **low-carbon energy**
- Improved evidence for **SDG14 Life Below Water** and **SDG15 Life on Land** has propelled these into the top 5
- SDG17 Partnerships – STARS reporting and **evidence of our collaborations with government** and NGOs

We now have **5 SDGs ranked in the top 10** and **13 SDGs in the top 100**



Source: Annual results from THE Impact Rankings

Maintaining our place as the global leader in SDG 13 Climate Action requires improving our low-carbon energy use and our world-class research in the field



Construction is a major global emission source and for the University of Tasmania given the major redevelopment of all our campuses that is underway

Today

Buildings account for 39% of global energy related carbon emissions

- 28% from operational emissions
- **11% from materials and construction**

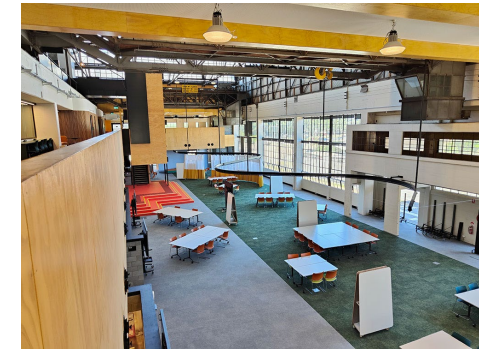
Tomorrow

By 2060, the total global floor area of buildings will double, with more than 50% of this anticipated within the next 20 years.

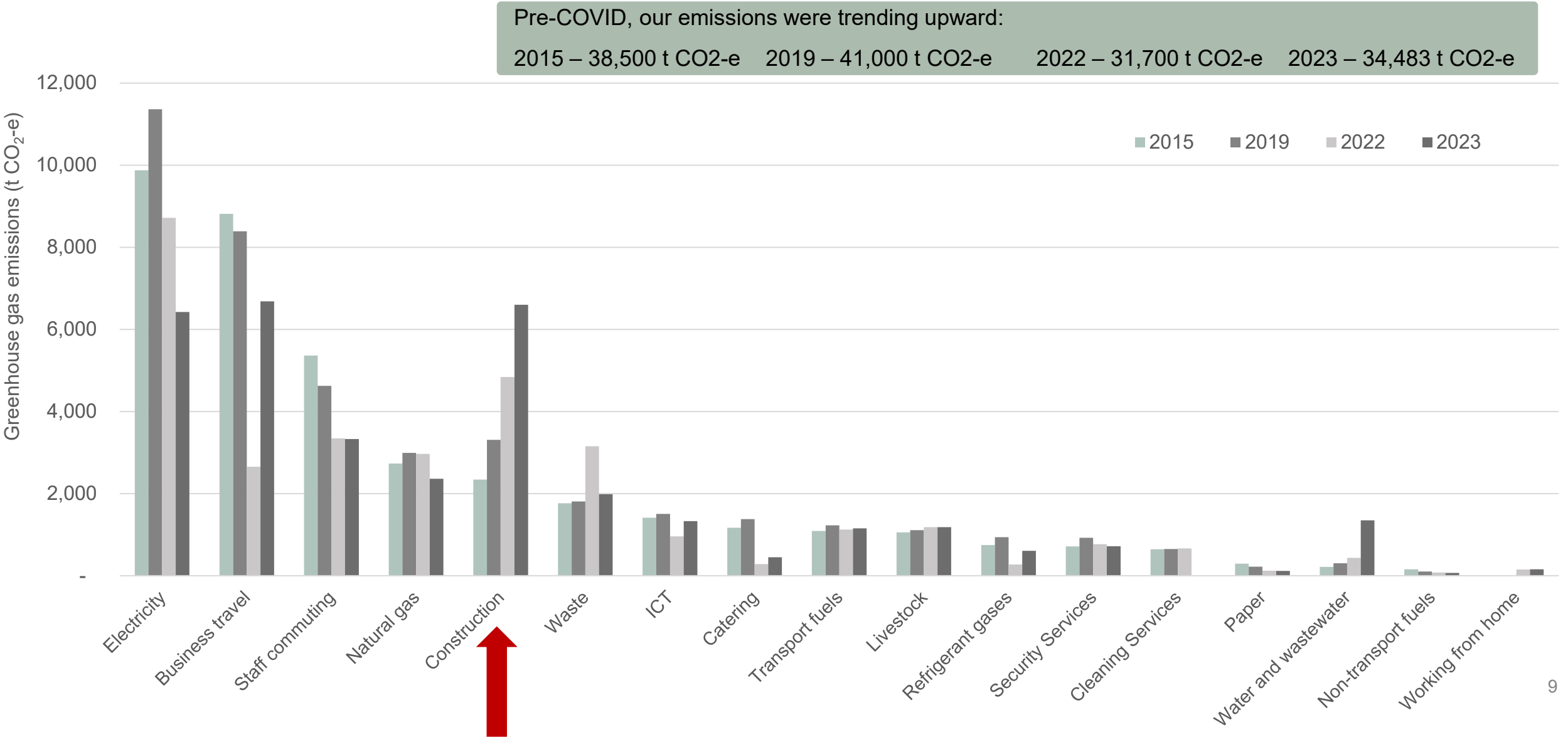
80% of buildings in use in 2050 already exist today.

97% of the building stock is not efficient enough to comply with future carbon reduction targets.

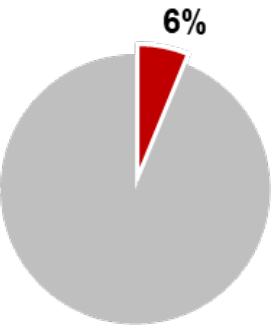
We are mid process of a \$750m program of works that cover new builds and major refurbishments across all our campuses in Tasmania and New South Wales



We have tracked emissions since 2015 and while we have made progress in some emission sources and it is clear that construction emissions stand out

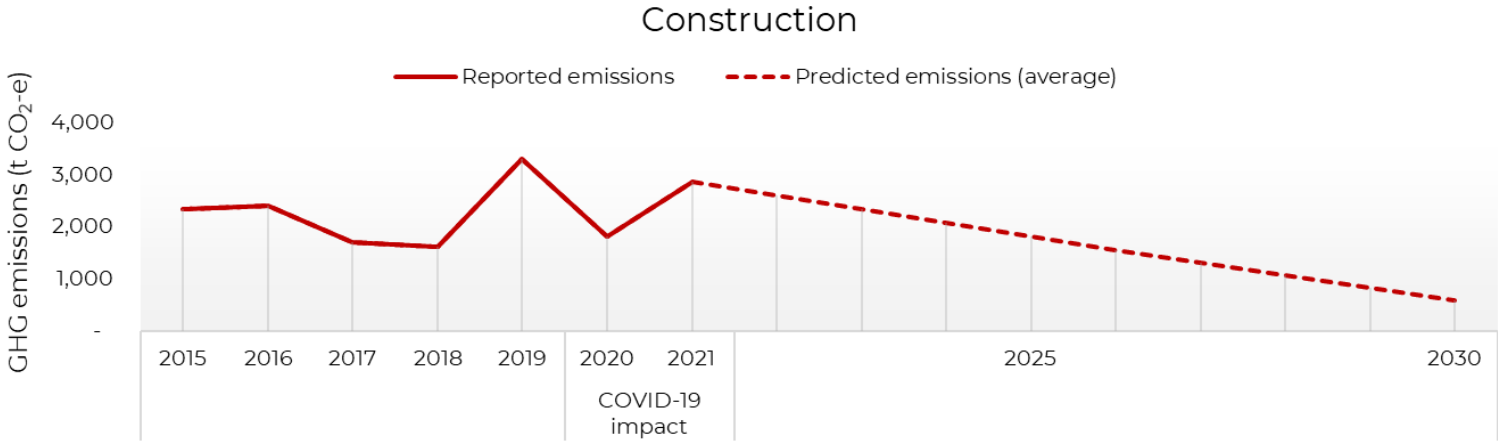


Our Emissions Reduction Strategic Plan 2022 – 2030 requires a minimum 50% reduction in our gross emissions by 2030, including construction



Overall target reduction on baseline

- 2025: 20-25%
- 2030: 70-80%



Enablers

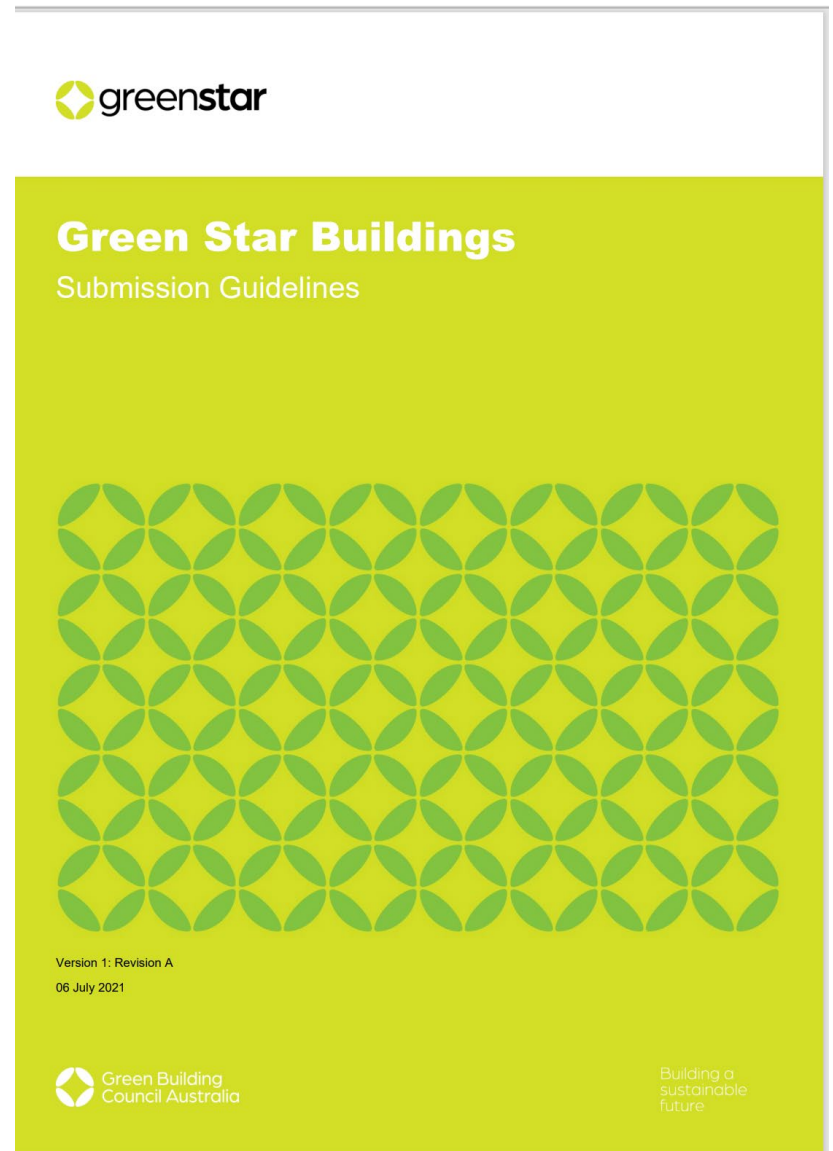
- Building design scopes and guides prioritise ESD outcomes and carbon reduction
- Inclusion of circular economy principles in tenders, contracts, and leases (e.g., requiring resource recovery of construction and demolition materials)
- Effective data collection and maintenance

#	Action	KPIs / Targets	End by	Cost Level	Responsibility	Notes
1.	Ensure all new and refurbished buildings preference low carbon materials and fittings	Minimum 20% reduction in embodied carbon vs a reference building	2022 and ongoing	nil - \$500k depending on building	Campus Futures and Campus Services	<ul style="list-style-type: none">• Cost estimation is material and fitting dependent• Minimum 30% reduction internal target
2.	Minimise use of new materials in favour of reuse and refurbishment	% of value of materials that are new	Ongoing	nil - \$50k depending on project	Campus Futures and Campus Services	<ul style="list-style-type: none">• Adaptive reuse, includes existing building stock and specific materials within builds• Cost estimation dependent on material and fittings

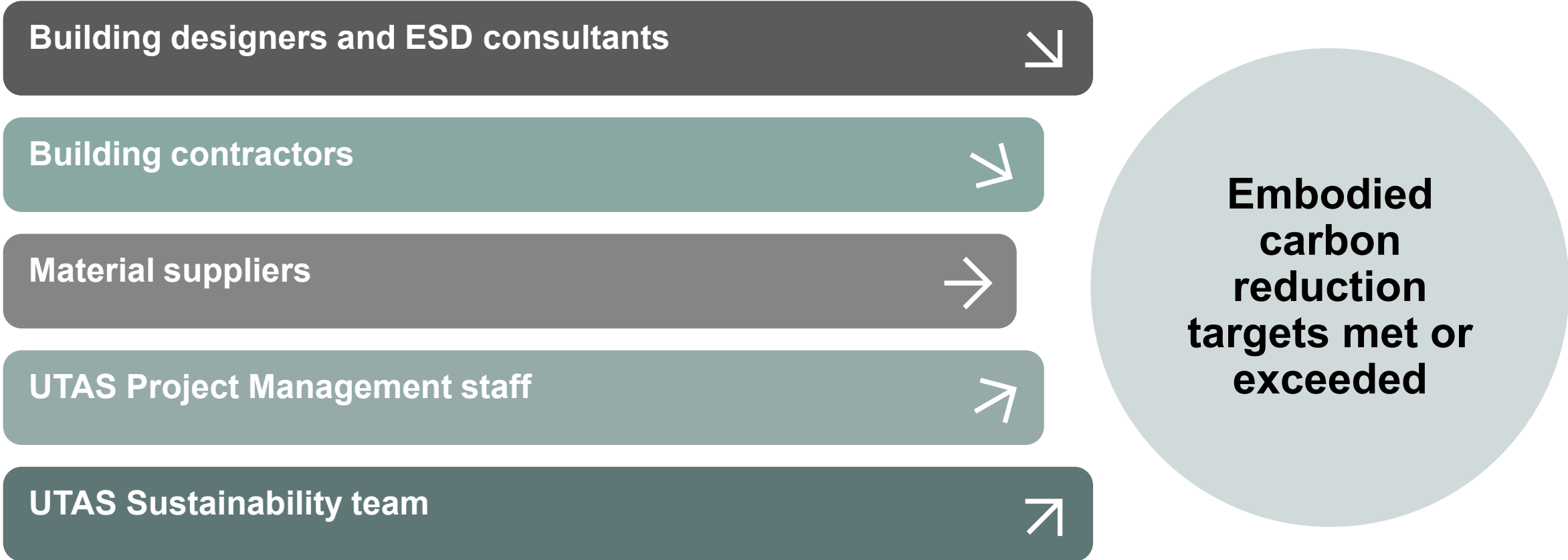
Our sustainable design strategy includes promoting a low carbon future and is embedded in our Green Bond Framework

Low carbon campus buildings eligibility require:

- Bringing our environmental and financial sustainability focus together through a Green Bond Framework
- Meeting a **target reduction in upfront carbon** (minimum Green Bond target 20%, but internal target is >30%)
- Delivering **operational energy use reductions**
- **Green Star credit** methodology used (but not seeking rating):
 - Standardised and established industry methodology that is widely understood and transferable between project teams
 - Modelling protocols have been benchmarked and tested against global standards and through local industry working groups



Achieving our carbon reduction efforts in our buildings requires support from a range of stakeholders



Categories of building-related carbon - Rivers Edge building (design)

Category	Description	Carbon Reductions Compared to a Standard Practice Building	
Upfront Carbon	Carbon emissions associated with the initial construction of the building	1,253	32.0%
Upfront Carbon (inc. sequestered carbon)	Carbon emissions associated with the initial construction of the building + sequestered carbon that exceeds product impact (refer Section 3.5 for details)	1,294	33.1%
Embodied Carbon	Carbon emissions associated with initial construction of the building (upfront carbon), plus material replacements and maintenance over the building life, and then processing and disposal of materials at the end of the building life (end-of life)	1,349	28.9%
Operational Carbon	Carbon emissions associate with energy and water consumption over the building life	786	22.6%
Whole Life Carbon	The sum of embodied, operational, and circular carbon	2,032	26.1%

Initiatives to achieve significant carbon reduction

- Lower carbon, locally sourced Boral Envisia® concrete
- Reuse ~2.6km of disused gas pipeline as structural piles
- Replacement of asphalt with compacted rock
- Low impact internal finishes (flooring, partition construction, wall finishes)
- Certified and locally sourced carbon neutral bricks
- Timber/Cross Laminated Timber structural elements using local Tasmanian supply chain



Other sustainability initiatives

- Heat capture (particularly in sciences building)
- Electric charging stations (cars, bikes, scooters)
- End of trip facilities for active transport
- Reduction in GFA from Newnham campus to Inveresk improves space utilisation to Australian sector averages



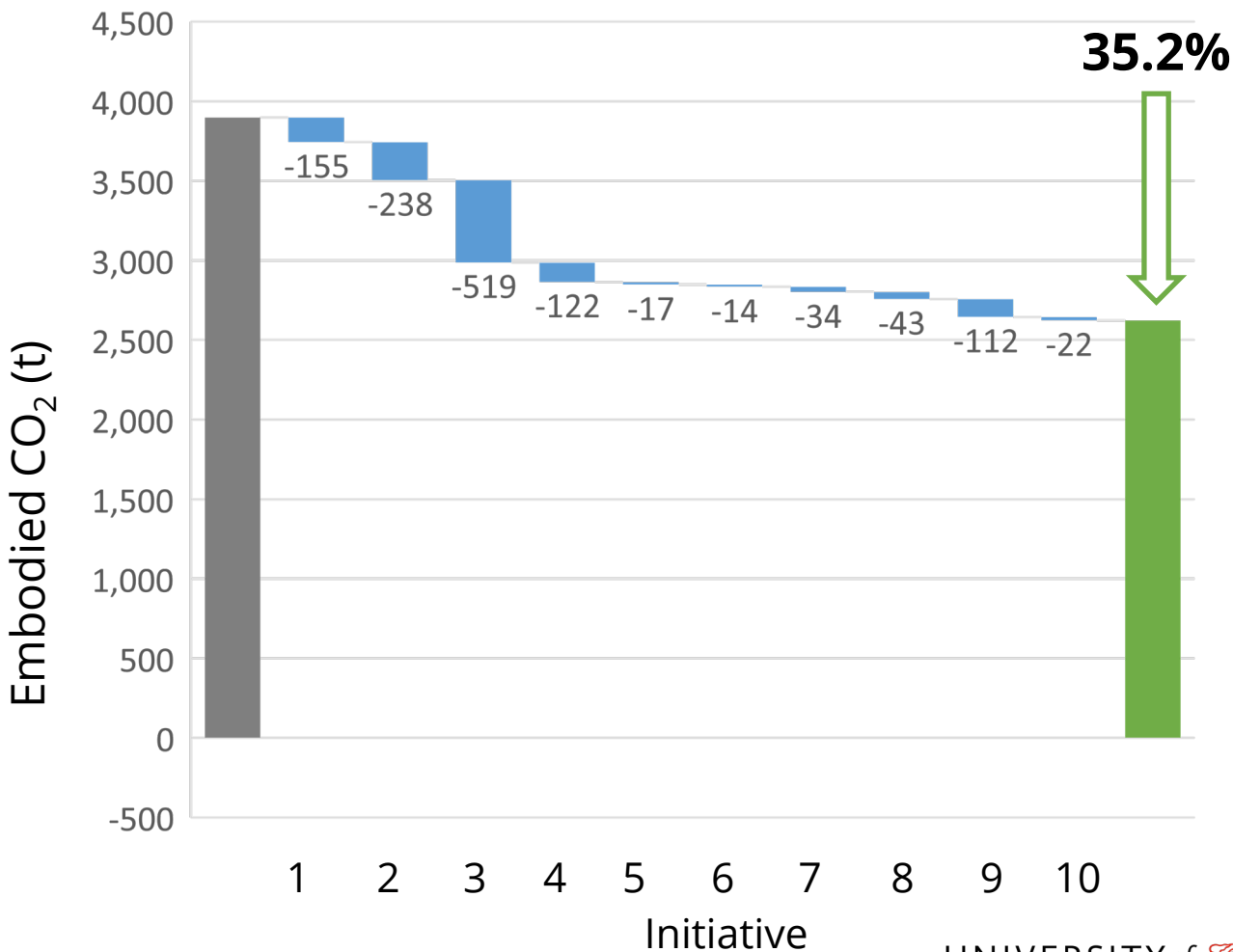
Willis Street Sciences Building will contain 400m³ of plantation grown Tasmanian Oak



Specific initiatives delivered carbon emission reductions and/or sequestration

Rivers Edge, Inveresk Campus, Launceston

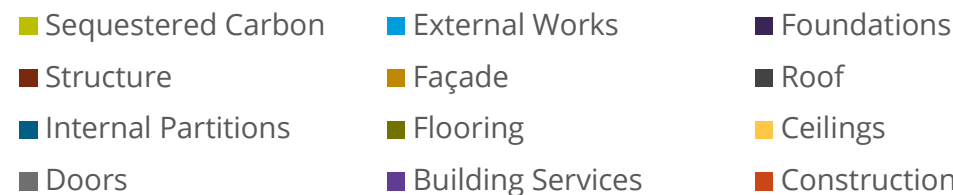
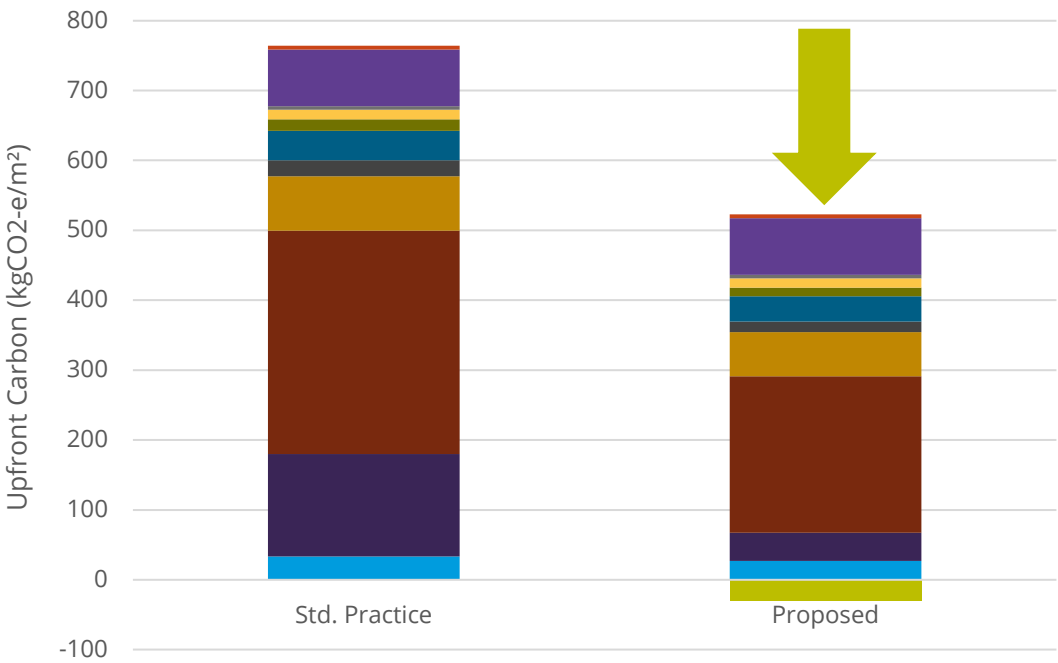
Init.	Description	Carbon Saving (tCO2-e)	Sequestered (tCO2-e)
1	Post tension structure	155	0
2	Reused steel for structural piles	238	0
3	Boral Envisia concrete	519	0
4	Level 4 timber structure	122	17
5	Timber atrium roof	17	5
6	Timber stair	14	8
7	Lightweight external wall construction	34	0
8	Carbon neutral bricks	43	0
9	Low impact flooring, wall linings, and substrates	122	10
10	Timber studs	22	60
ALL	All adopted initiatives	1,276	-100



If we include sequestered carbon (in wood), the figures are even better!

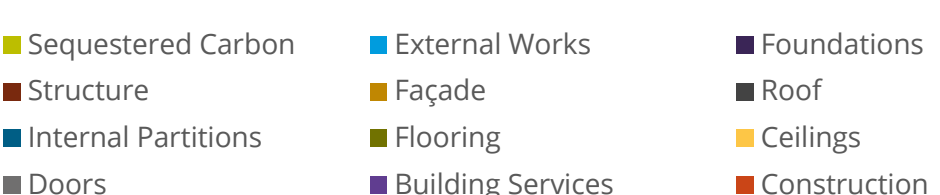
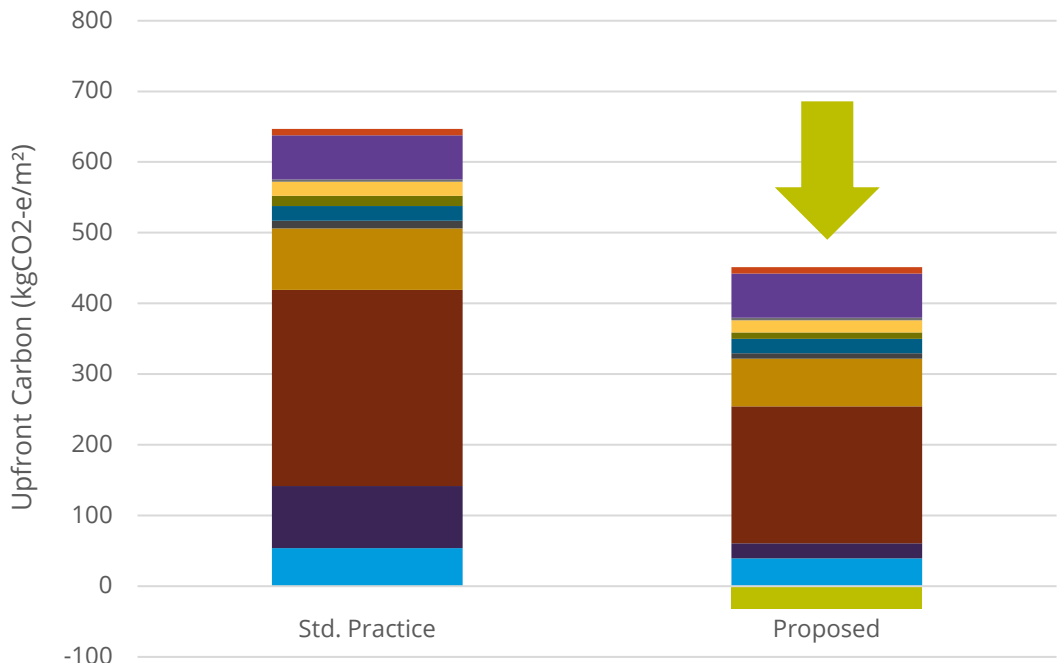
Willis Street

- 31.6% reduction excluding sequestered carbon
- **35.5% reduction including sequestered carbon**

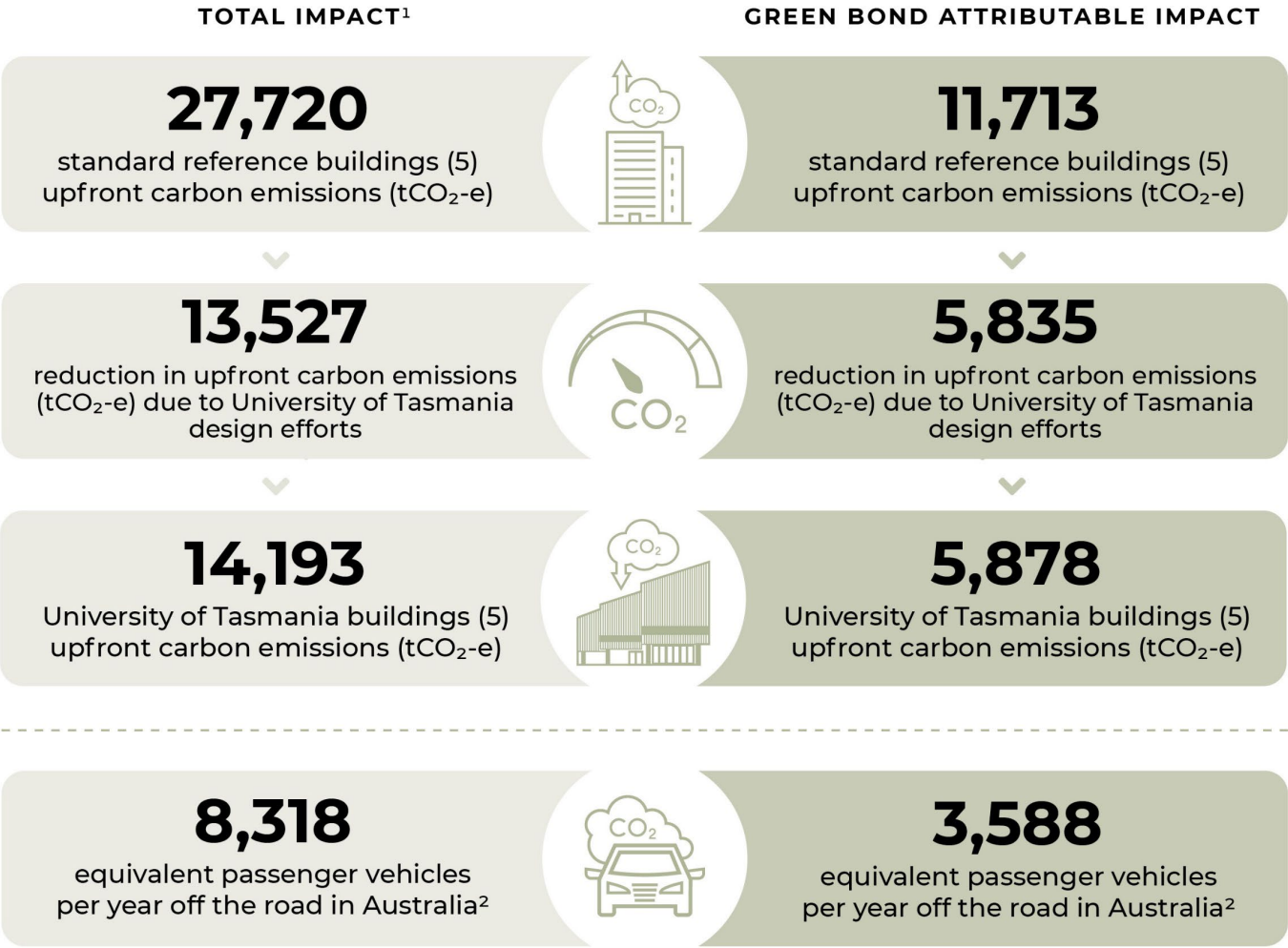


Rivers Edge

- 32.7% reduction excluding sequestered carbon
- **35.2% reduction including sequestered carbon**



Upfront carbon emissions reductions achieved under our Green Bond Framework to date



So far, across five projects we have average reductions versus reference buildings of:

- >32% for new builds
- >60% for re-purposing existing buildings, and
- **avoided 13,527 tCO₂-e**

¹ Total impact includes eligible Northern Transformation campus buildings, which are co-funded by the Australian Federal Government, Tasmanian State Government and the University of Tasmania.

² The average annual emissions from a car is calculated to be 1.63 tonnes of tCO₂-e. This is calculated from the National Transport Commission of CO₂ emissions for a new passenger cars and light SUVs vehicle sold in Australia in 2022, and the average kilometres travelled by a passenger vehicle for the 12 months ending 30 June 2020 by the Australian Bureau of Statistics.

Key success factors

- ✓ **Green Bond Framework** ties together funding for new campuses and emissions reduction efforts that attracted broad interest globally.
- ✓ **Design guidelines** with a broad sustainability focus, but the embodied carbon reduction commitment ensures clarity of alignment of our built environment (new builds and refurbishments) function with our emissions reduction efforts.
- ✓ **Procurement documentation** includes appropriate clauses and phrases to make clear the expertise sought and commitment to work on innovative solutions
- ✓ **Specific budget allocation** for additional sustainability outcomes above core project requirements, which includes the embodied carbon reduction.
- ✓ **Engaging a broad range of suppliers** to identify products or changes they could make to reduce the embodied carbon content. Suppliers selected on expertise and ability to deliver embodied carbon reduction and other sustainability outcomes).
- ✓ **Upskilling delivery teams** - designers thru to project managers and builders.

Additional Information

[University of Tasmania Green Bond Framework](#)

Provides clarity for internal decision makers and partnering businesses on our commitment.

[International Capital Market Association's Green Bond Principles 2021](#)

Underpins the University of Tasmania Green Bond Framework.

[University of Tasmania Sustainability Policy and Strategic Framework for Sustainability](#)

Provides overall strategic direction that guide these efforts.

[One Click LCA software](#)

One Click LCA is a building Life Cycle Metrics software that allows calculation of Life Cycle Assessment, Life Cycle Costing, Carbon footprint and other environmental impacts.

[Environmental Product Declaration \(EPD\)](#)

An independently verified and registered document that communicates transparent and comparable data and other relevant environmental information about the life-cycle environmental impact of a product.

[Green Building Council of Australia - Upfront Carbon Credit](#)

Provides detailed definitions and calculation information.

[Climate Active Carbon Neutral Product Register](#)

Provides a list of producers of carbon neutral materials and products.

[Case study in Sustainable Development Solutions Network](#)

Provides a full text overview of the approach



Thank You

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