

# Estimating Emissions

# Early

Guiding early design using whole of life estimates: a building case study

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**ALCAS 2023**

# Commitment to net zero advocacy



#Advancing Net Zero @WorldGBC

**EP 100 | THE CLIMATE GROUP**



WORLD GREEN BUILDING COUNCIL



**Net Zero Carbon Buildings Commitment**  
Signatory form – Businesses & organisations

**Organisation details**

Trading name:	Atelier Ten
Registered name:	Atelier Ten Australia Pty Ltd
Address:	Level 1, 79 Myrtle Street Chippendale NSW 2008 Australia

Atelier Ten advances  
9 June 2020

Atelier Ten joins nearly 100 business  
The World Green Building Council  
buildings to 100% by 2050. To fa  
resources such as certification sc  
action towards net zero operating

## Commit

Commit to being net zero carbon for business operations by 2021, and only owning and occupying assets that are net zero carbon in operation by 2030.

## Disclose

Measure and publicly disclose operational carbon emissions, and reporting progress via annual Sustainability Reports.

## Act

Develop and implement a carbon emissions reduction strategy that includes energy demand reduction targets, building measures to decarbonise grids, and renewable energy procurement.

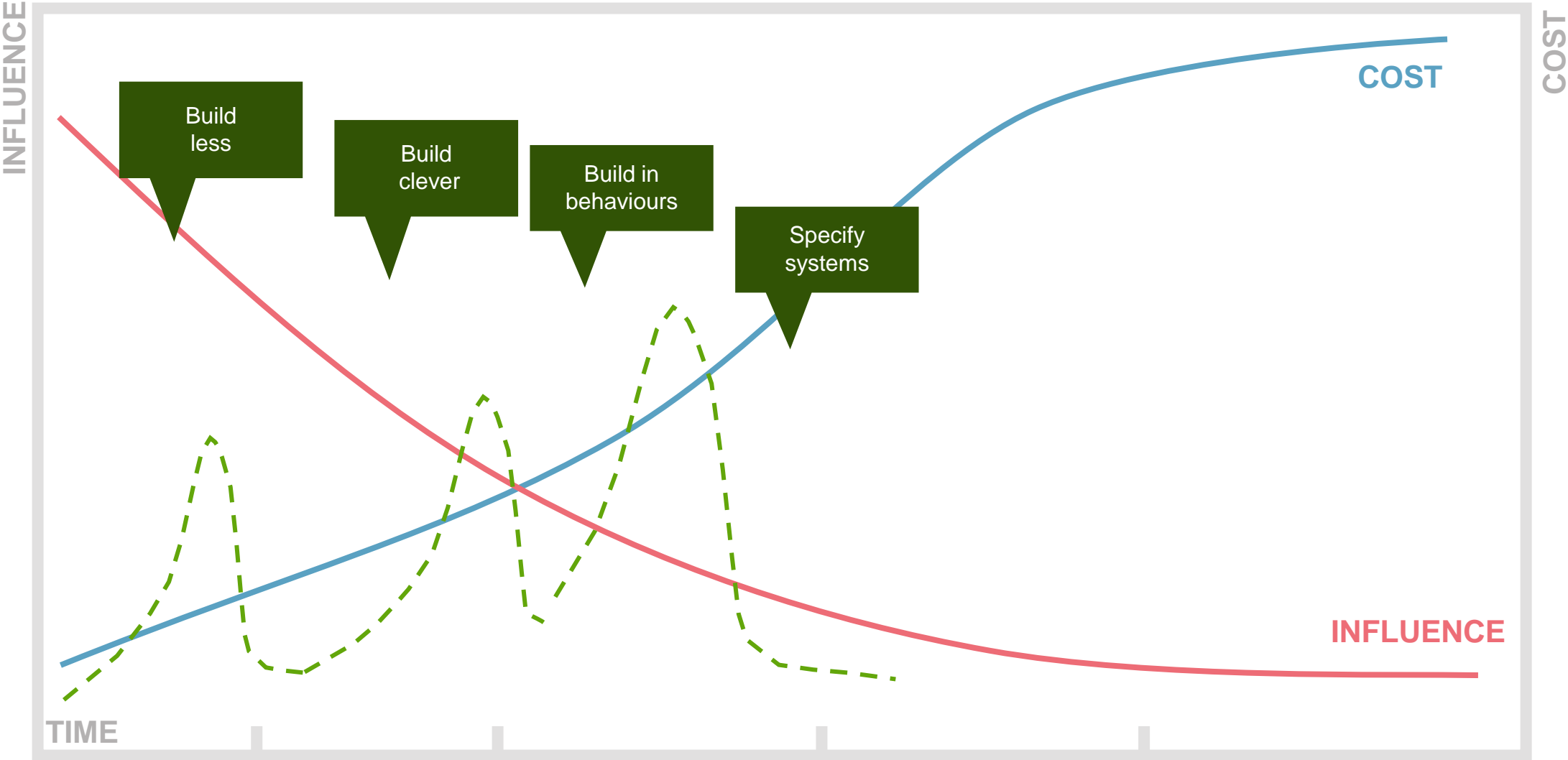
## Verify

Undertake third party verification of operational level data through independent accredited auditors. Publicly report assured data via annual Sustainability Reports.

## Advocate

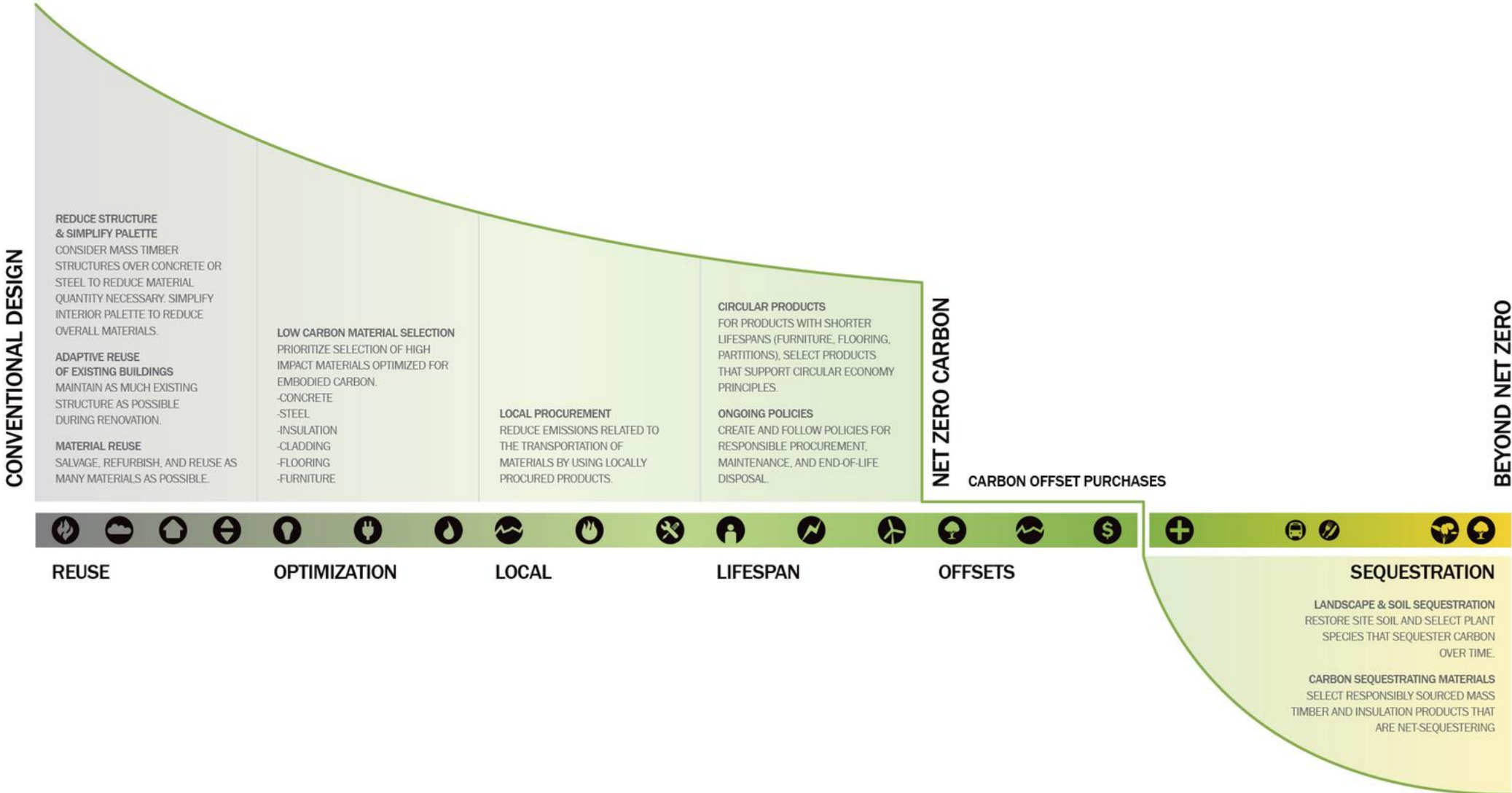
Continue to advocate for a zero carbon future and leading by example by providing a net zero carbon pathway for every design project undertaken by 2021.

# Opportunity to influence outcomes

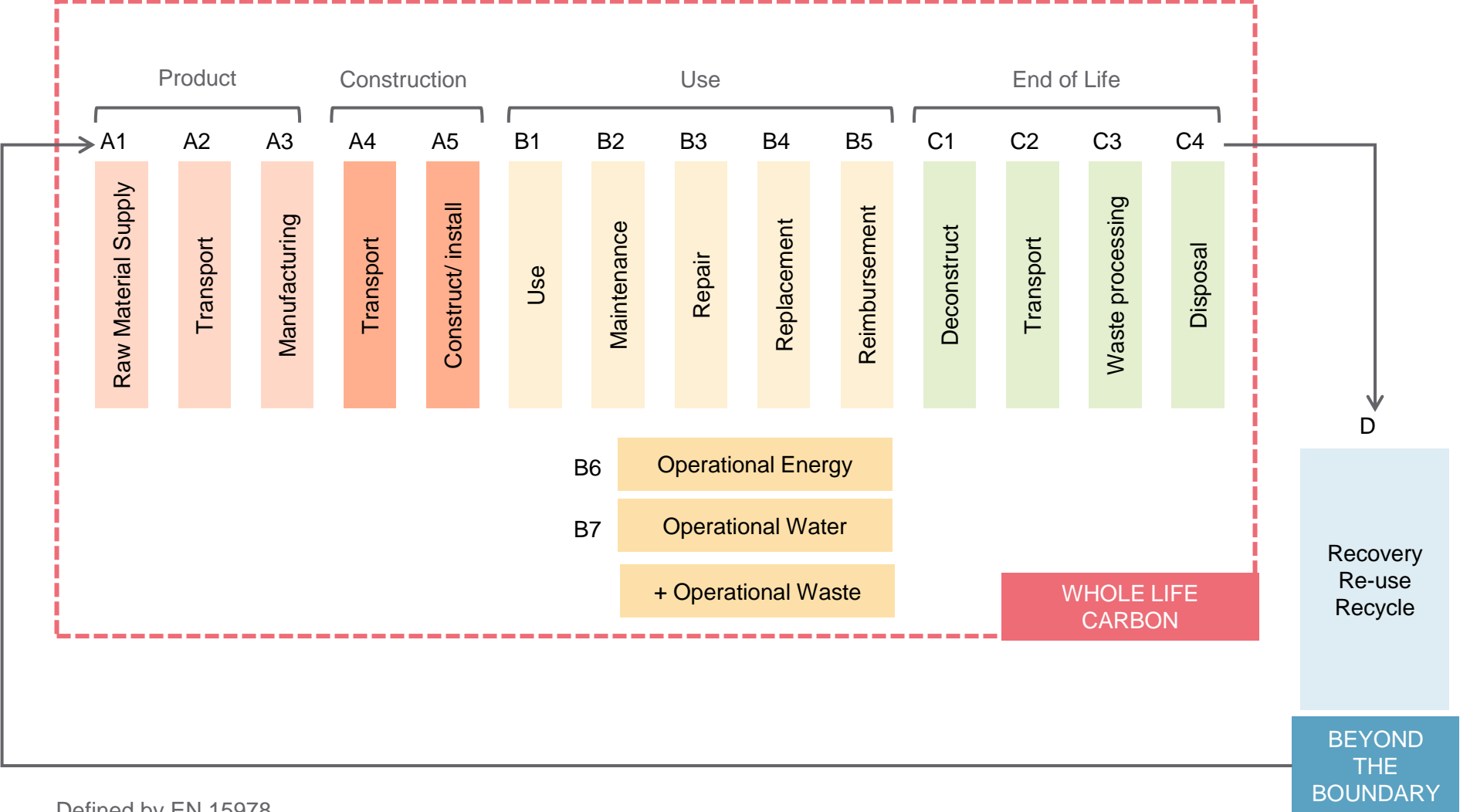


Original Concept by Patrick MacLeamy (2009)

# Emissions roadmap



# Holistic and whole of life



Defined by EN 15978

# Estimating Emissions

Available from project team

Need region + program specific benchmarks with GFA as functional unit



X



X



=



**Area breakdown (ie. GFA)**  
based on program provided by the client or architect for the project

**Resource use intensity (eg. kWh/m<sup>2</sup>yr)**  
For emissions source categories based on disclosure data as programmatic benchmarks

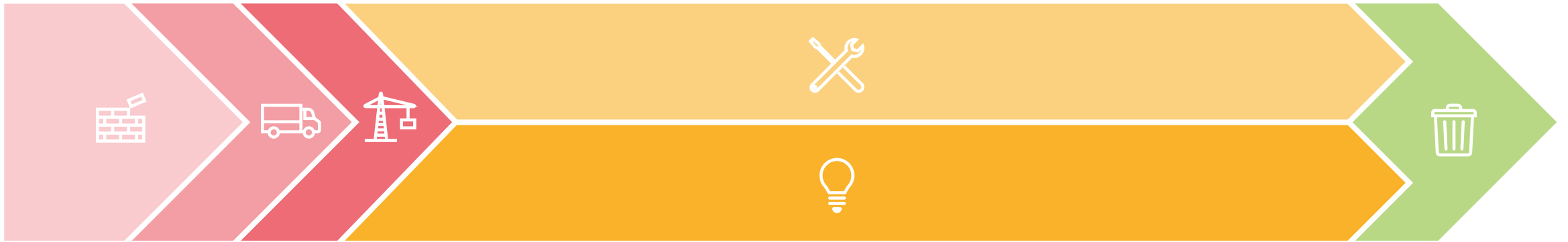
**Resource emissions profile (eg. kgCO<sub>2</sub>-e/kWh)**  
For emissions source categories based on public inventories or disclosure data

**Emissions (eg. kgCO<sub>2</sub>-e)**  
To communicate hotspots of impact to design team at early stage of development

# Building Characterization



Cultural institute built in 2024 with exhibition spaces - long spans, 30,000m<sup>2</sup> mid-rise ~ commercial building



NSW location, operating from 2026, program including event, retail, F&B, education... temperature controlled, daytime operation, intermittent occupation, ~ shopping centre

# Benchmark Data

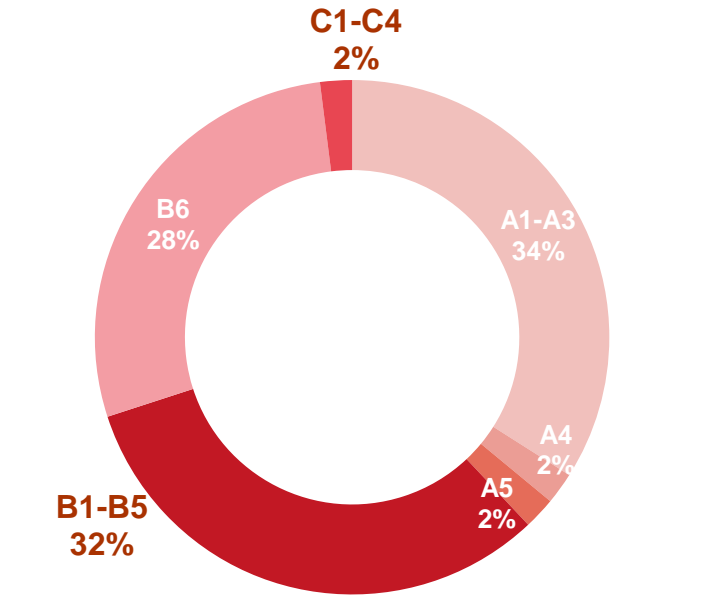
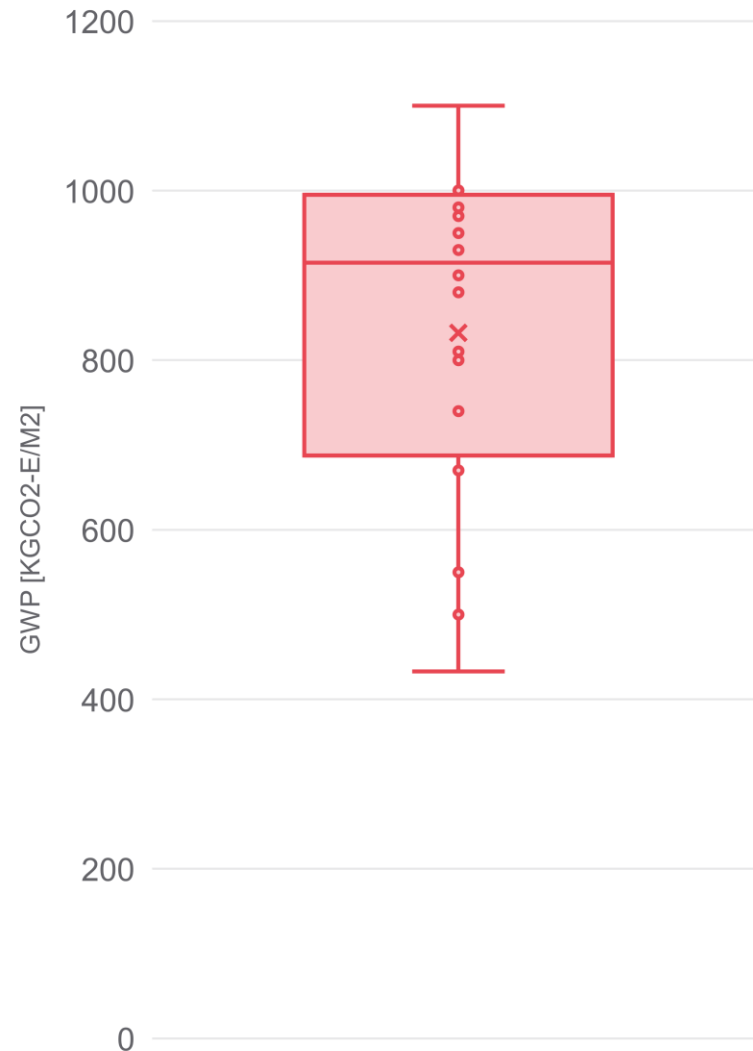


## Upfront (A1-A5)

**900**

kgCO<sub>2</sub>-e/m<sup>2</sup>

Excludes residential, prioritize Australian sources,  
LETI + CLF included as major global benchmarks  
for alignment (25 data points)



## Other embodied (B1-B4 + C)

**750 + 50**

kgCO<sub>2</sub>-e/m<sup>2</sup>

LETI office benchmark used as only whole of life  
typical breakdown found.



# Benchmark Data

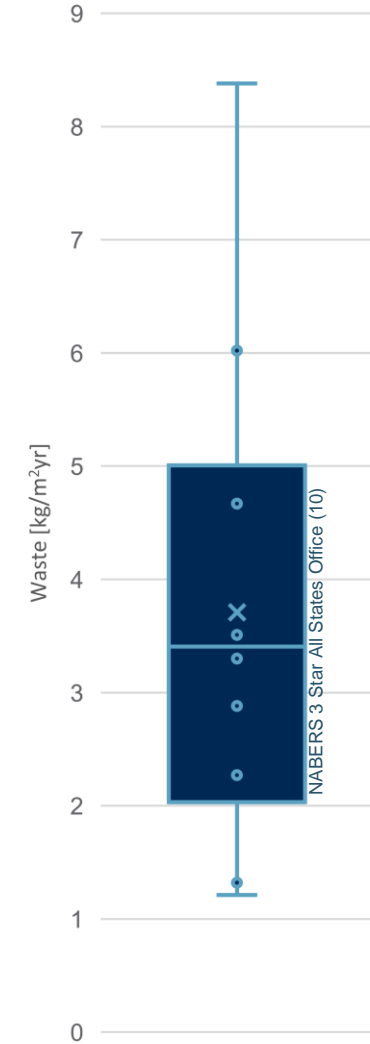
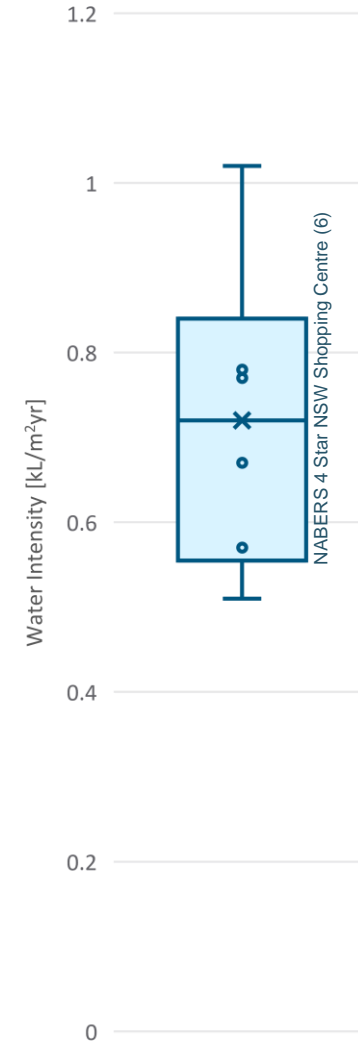
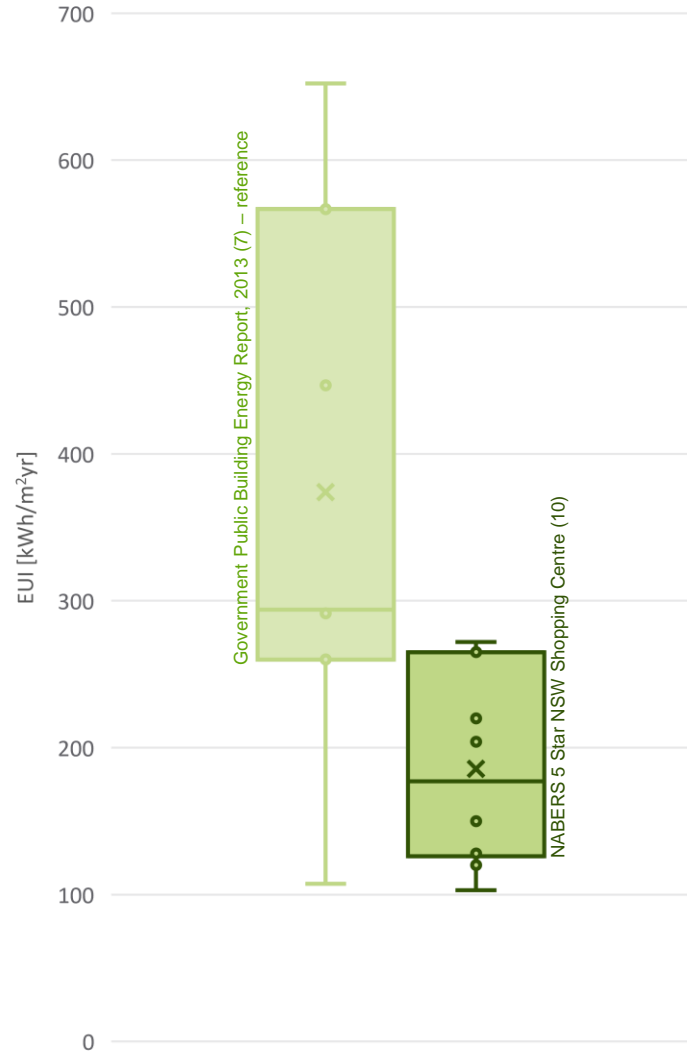


## Operations (B)

### Electricity + Water + Waste

Electricity + Water : NSW NABERS data for shopping centre ratings

NABERS Waste not available for shopping centres, office used however lower certainty of alignment



# Benchmark Data



## Operations (B) Electricity + Water + Waste

Electricity: Government grid emissions used  
Water + Waste: mining of NABERS and Climate Active provided benchmarks for NSW infrastructure.

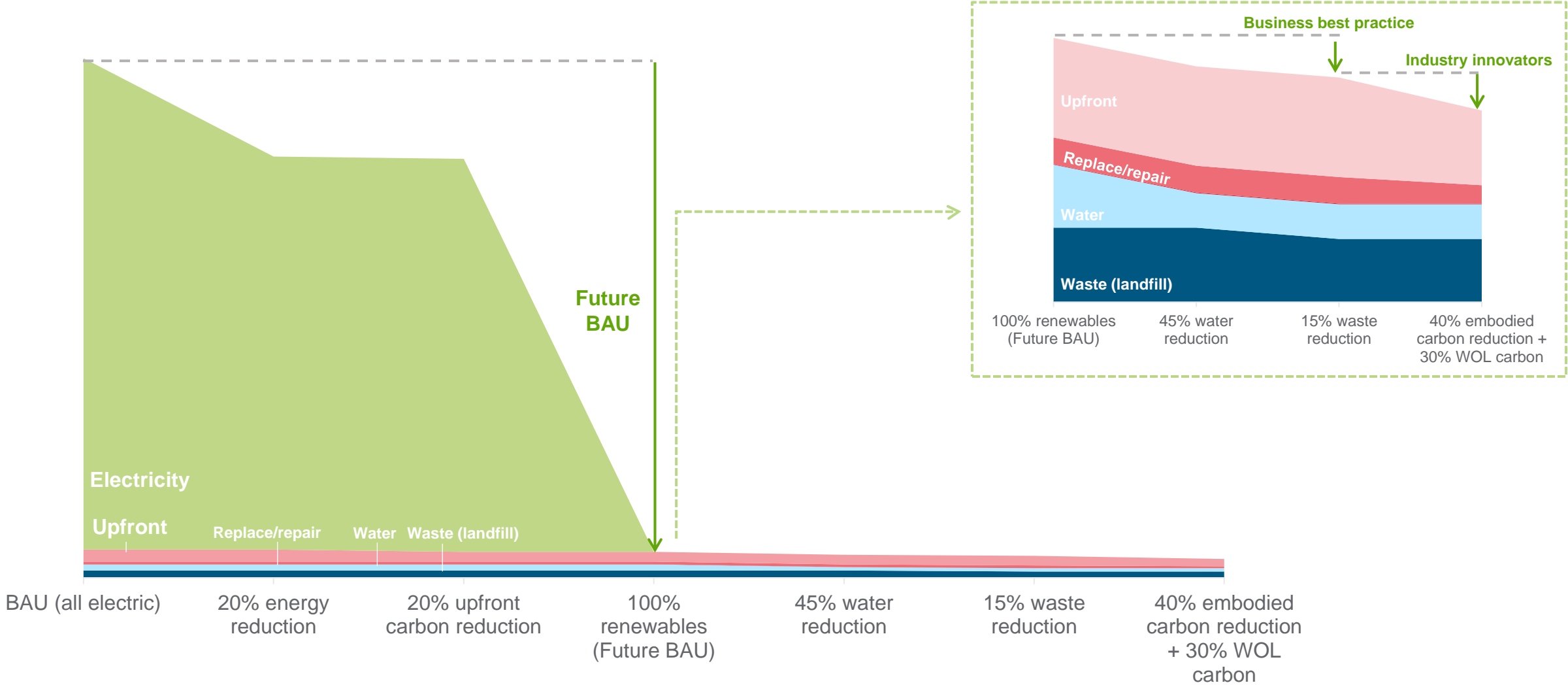
NSW Grid Electricity	NSW Water	NSW Waste
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DCCEEWS NGA Factors workbook (2022)	Climate Active PDS Mining (7 commercial data points)	Climate Active PDS Mining (4 commercial data points)
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<b>0.73</b> kgCO2-e/kWh	<b>0.002</b> kgCO2-e/L	<b>0.5</b> kgCO2-e/kg
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Assume decarbonization 3% for the 60y service life based on extrapolating improvement documented in DCCEEWS NGA Factors workbook 2019 – 2022

# Emissions Results



# Time Value of Carbon



Infrastructure decarbonization



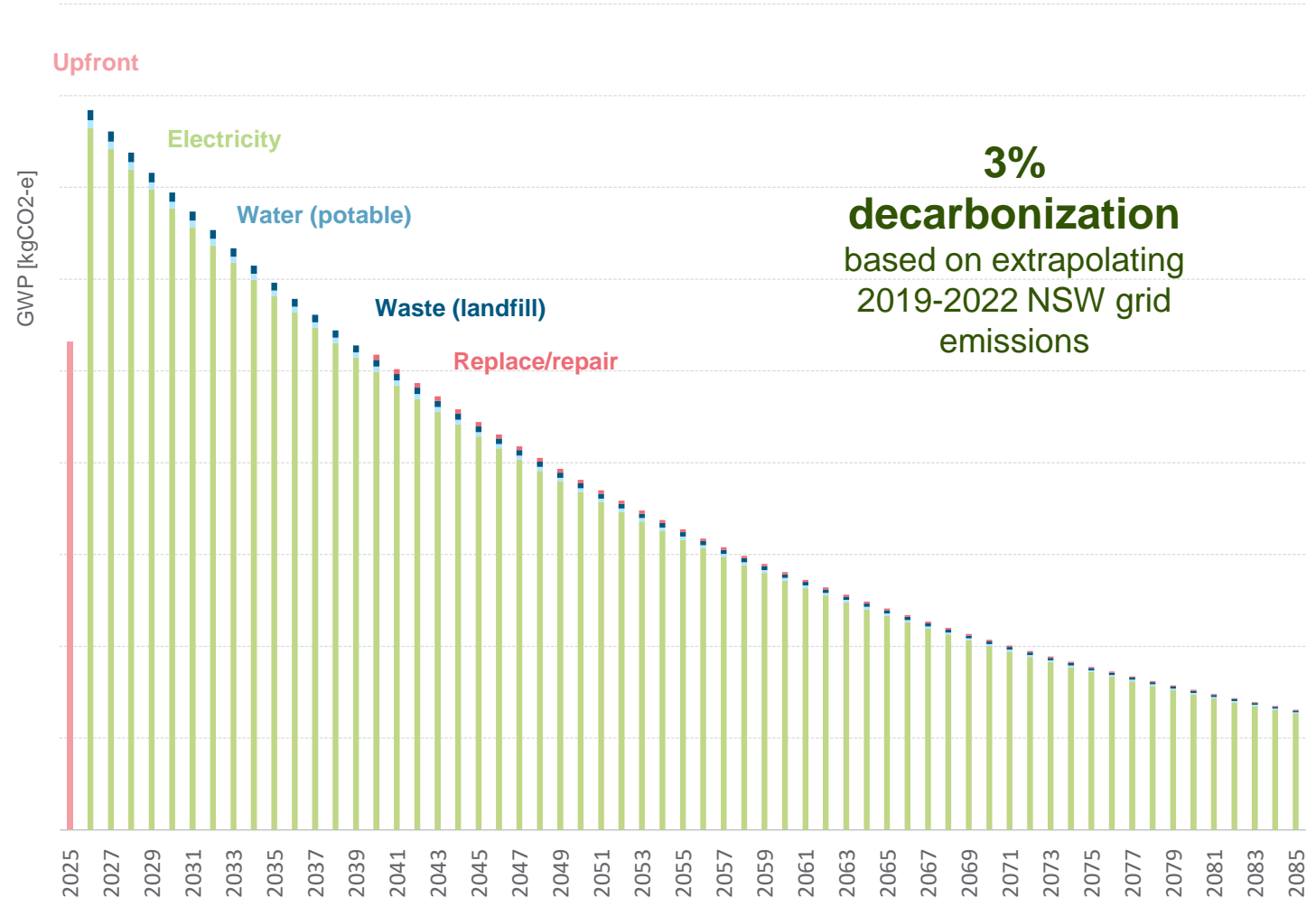
Emerging technologies



Warming potential of greenhouse gases



Annual commitments



# Hotspots for Design



All electric is the new normal



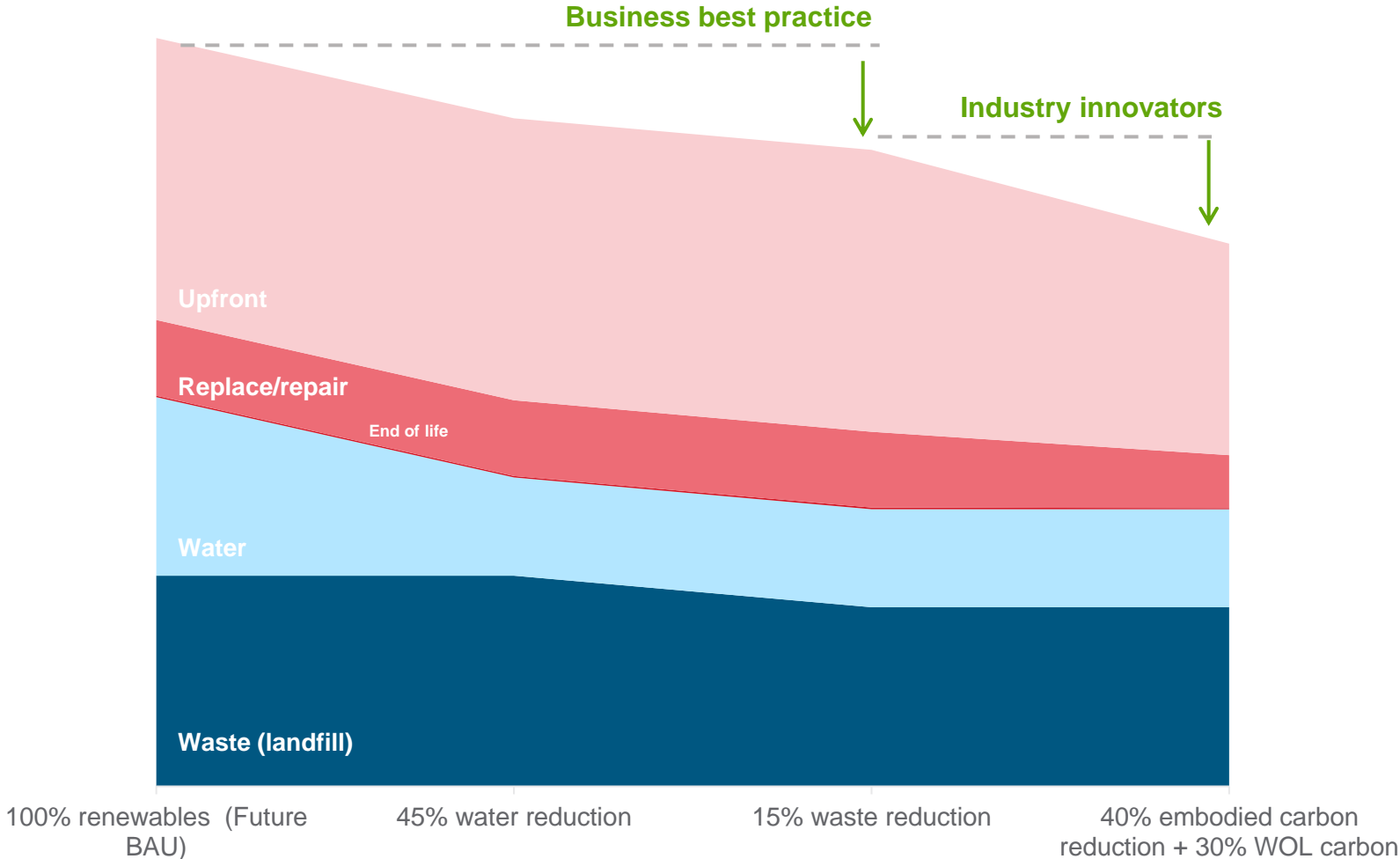
Time value of carbon



Refurbishment is key to industry innovation

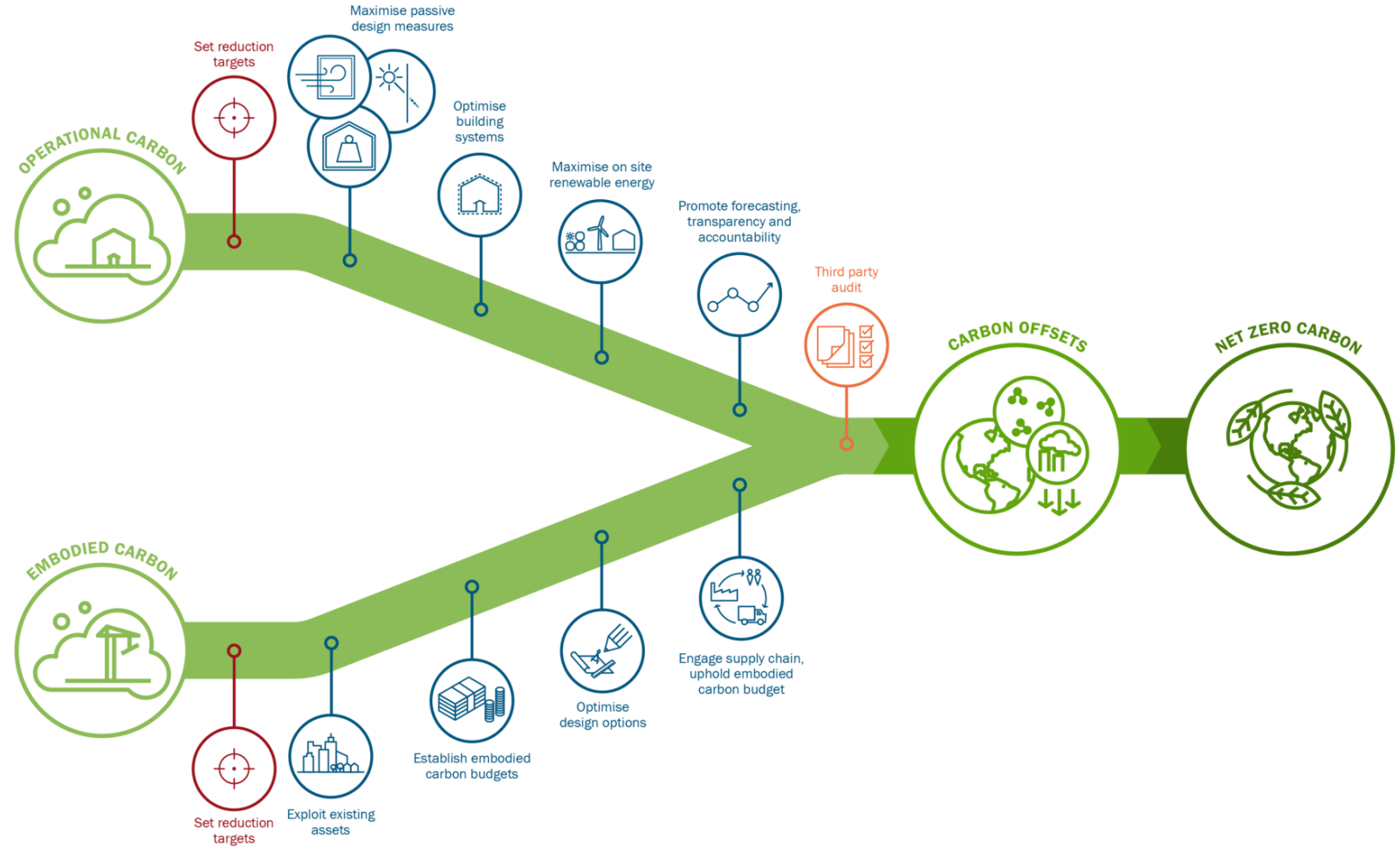


Engage decision makers with forecasted emissions



# Next steps

- LCA experts engage early on projects
- Report using language of governing standards and benchmarking certification
- Utilize public disclosure platforms data to close the loop of design and operation



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