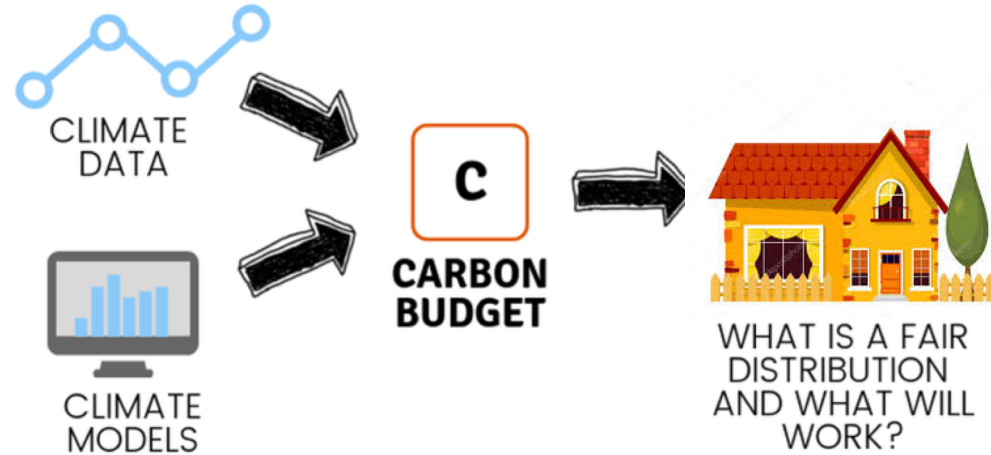


A top-down approach for setting climate targets for buildings: the case of a New Zealand detached house



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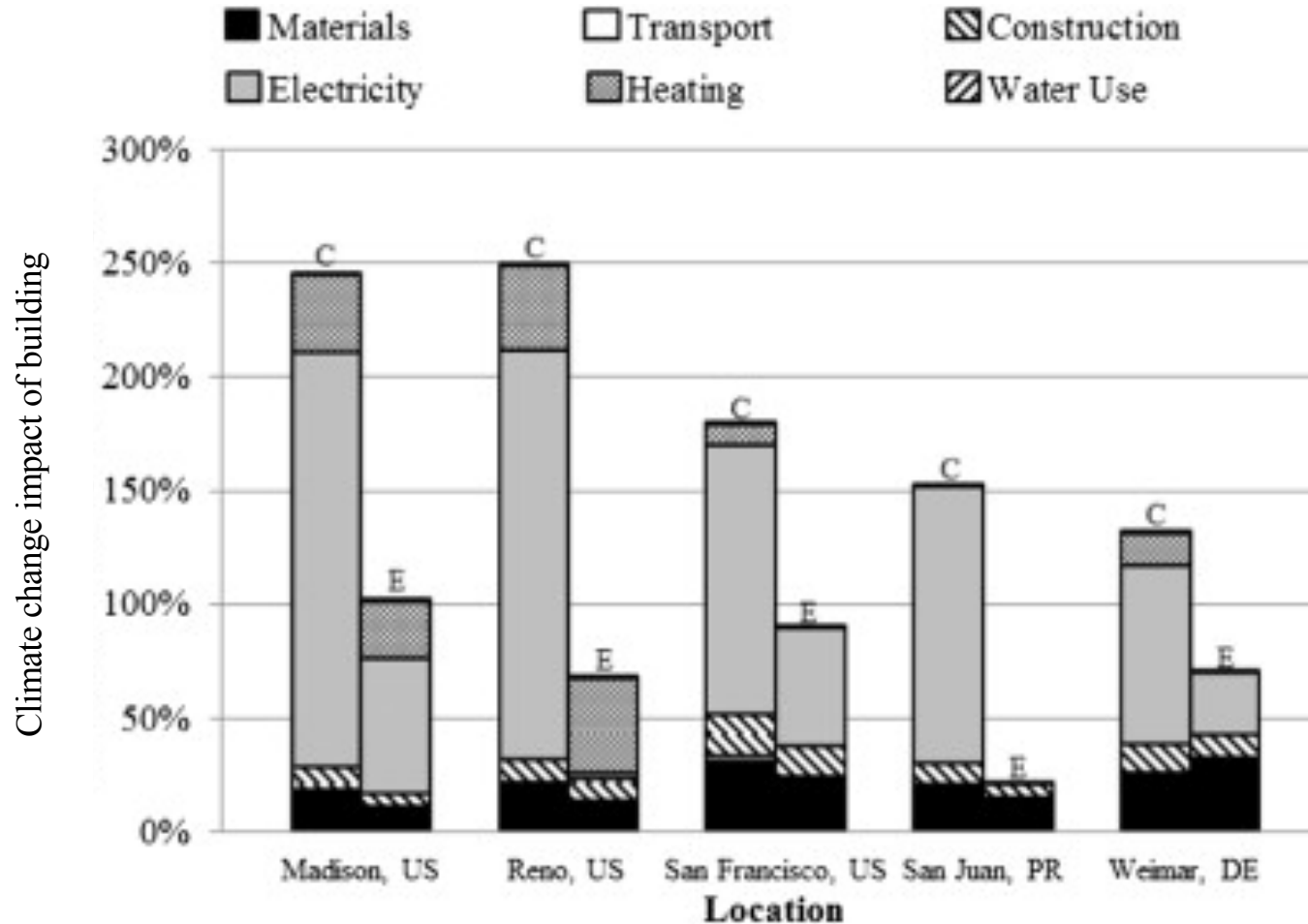


How often this happens to you?

WHY?

Q1) What does LCA **MEAN to buildings?**

A basis for relative improvements



Source: Russell-Smith et al. 2015

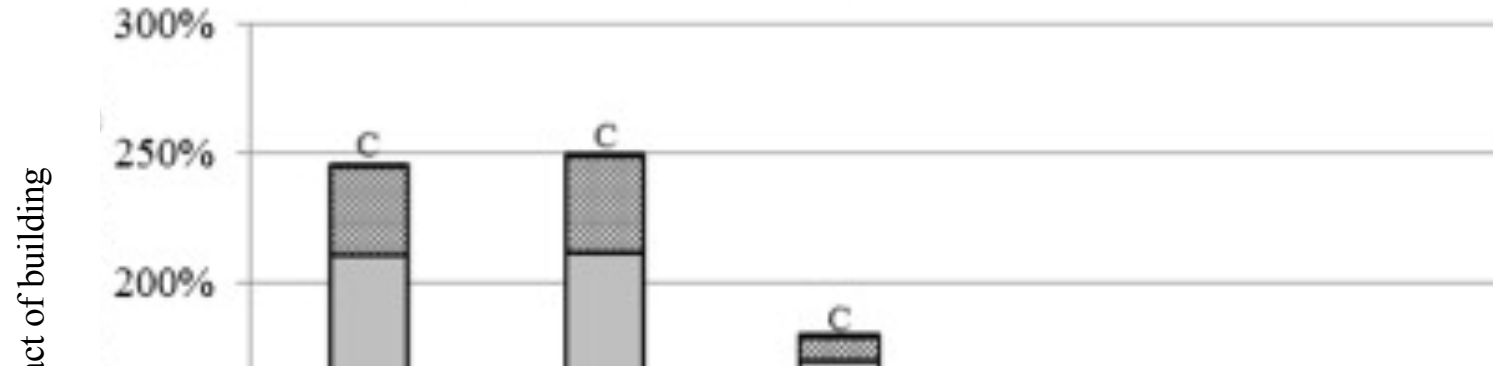
Q2) Are relative improvements **SUFFICIENT
for achieving environmental sustainability?**

a) YES

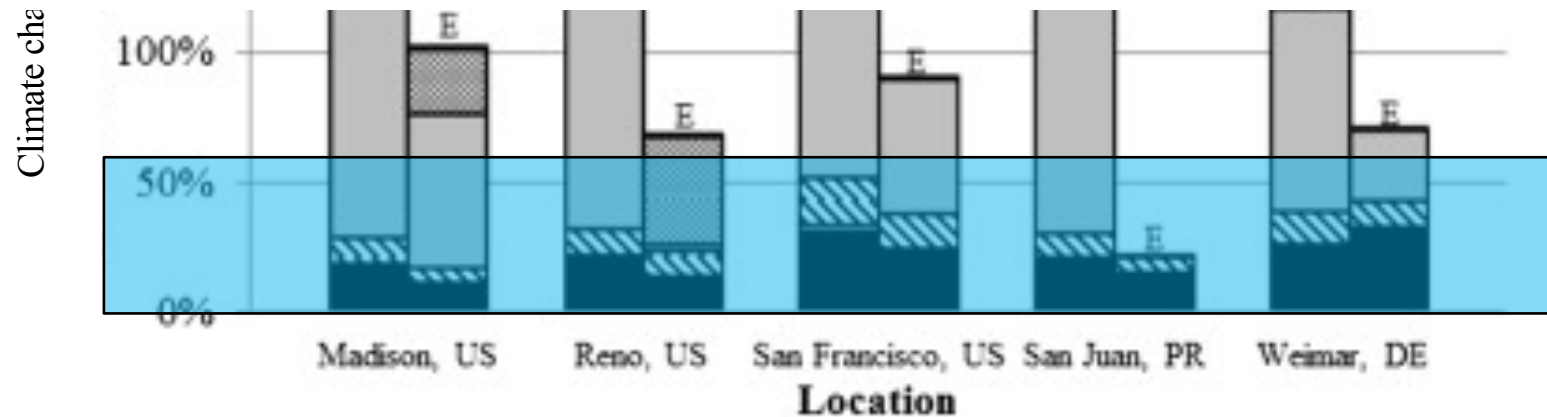
b) NO

c) MAYBE

Q3) What could be a SOLUTION?



Benchmarks: A Potential Solution

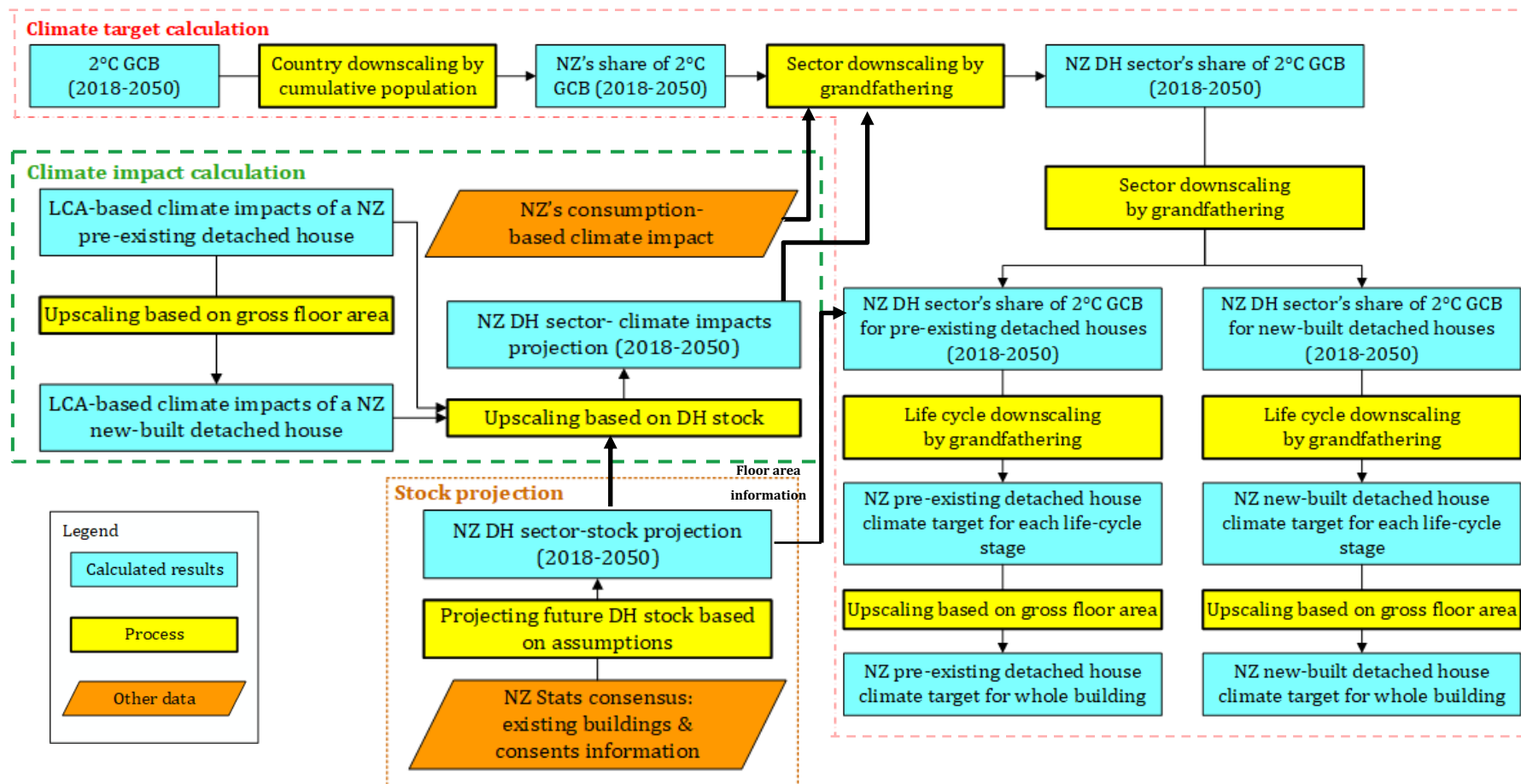


Source: Russell-Smith et al., 2015

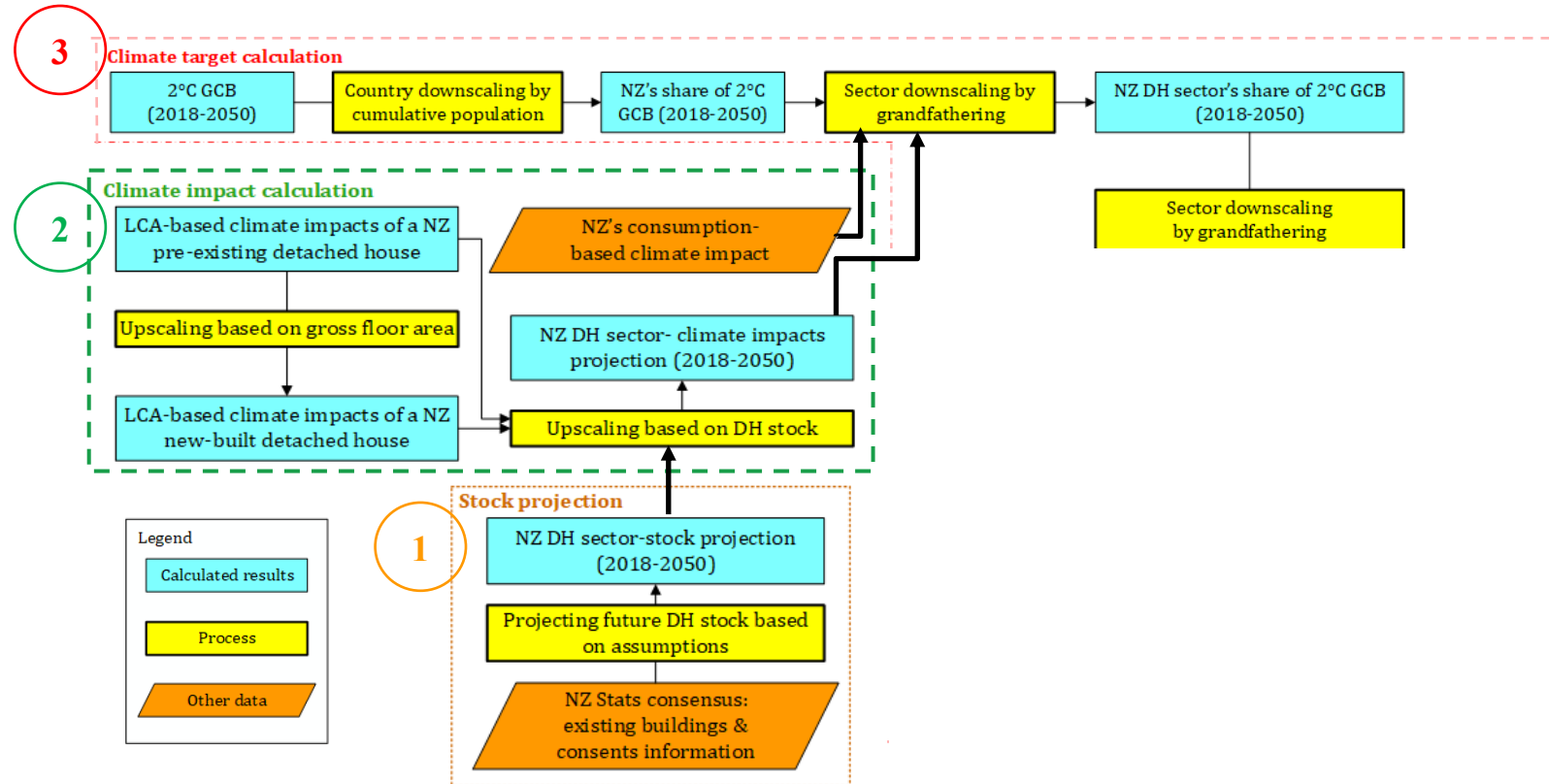
Research Context

- Benchmarks for both residential and commercial buildings already exist (e.g. Hoxha et al. 2016; Zimmerman et al. 2005)
 - Estimated a share of the 2°C global carbon budget (i.e. a target) for a future building
 - Switzerland: Zimmerman et al. (2005) and Hollberg et al. (2019)
 - Denmark: Brejnrod et al. (2017)
- However, these approaches are limited
 - Benchmarks are for the whole buildings
 - Fail to account for the timing aspect of buildings: building stock growth and changes in building size, energy consumption and material use in future
- Science-Based Targets (SBT) are still under development
- Lastly, no approach or benchmark exists for New Zealand

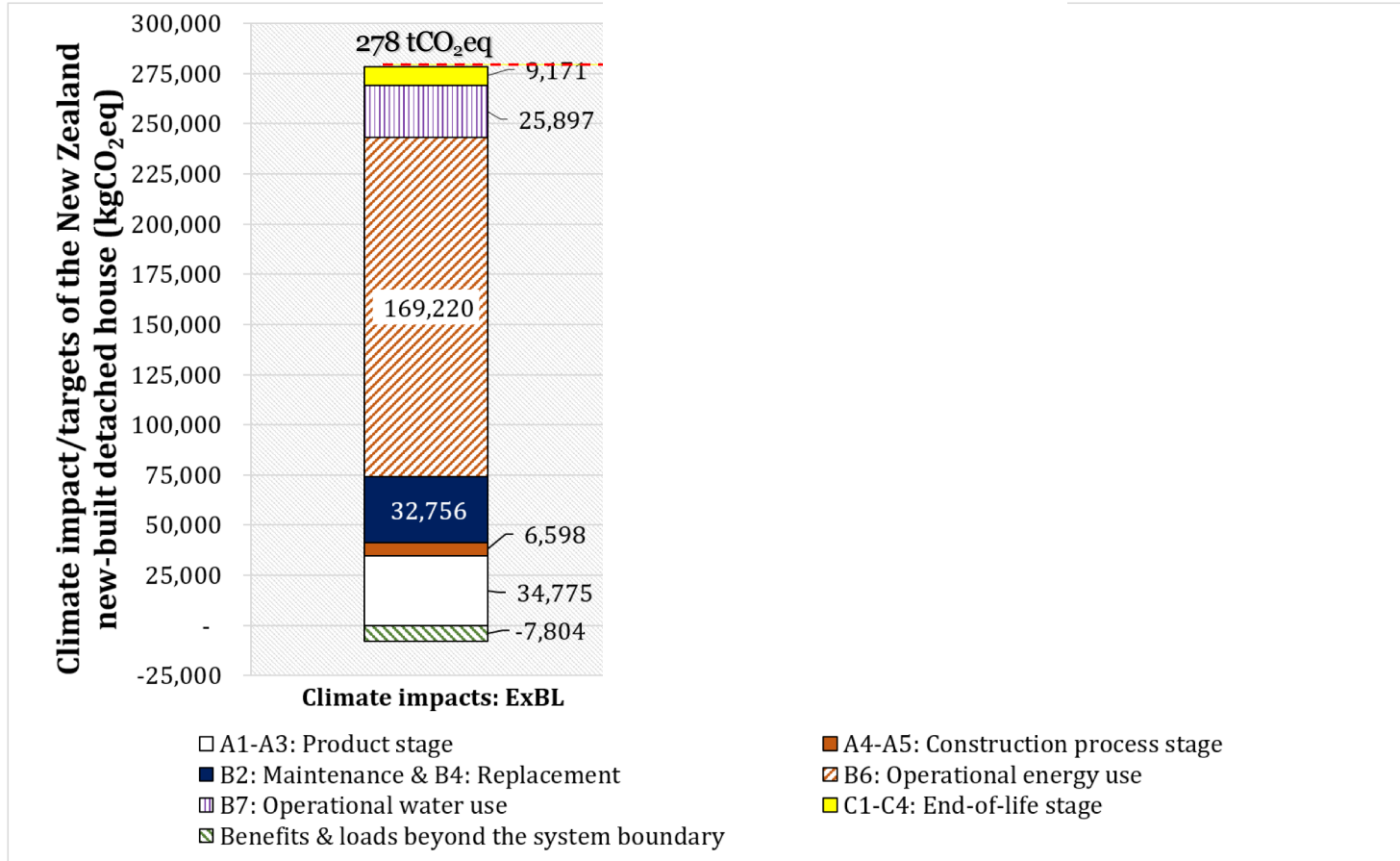
Our Approach: a case study of detached houses



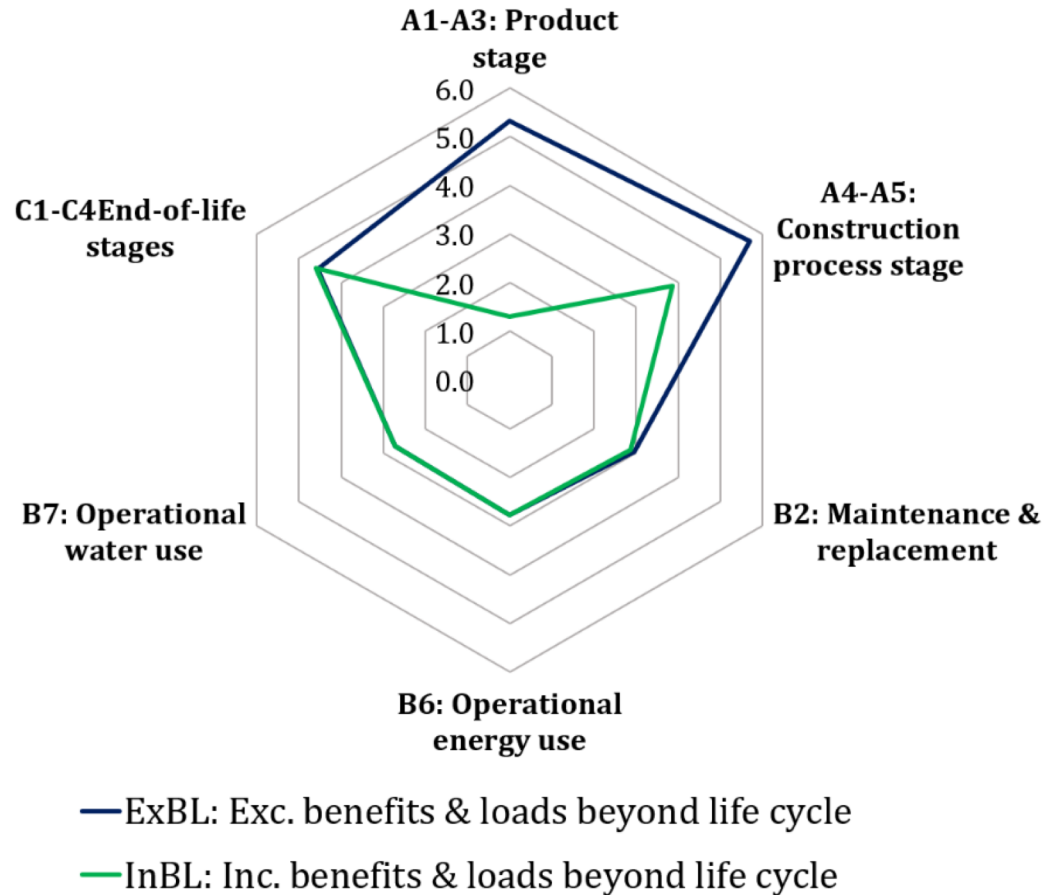
Our Approach: a case study of detached houses



Results-new built detached house



Results-new built detached house



Conclusions

- Greater scale of change is required than currently envisaged in building design and management
- On-going research:
 - Apply the model to other building types in New Zealand (e.g. townhouse, apartments, commercial office buildings)
 - Account for the uncertainty: global climate target and carbon budget, allocation methods
 - Scenarios for different climate zones, electricity mixes, material procurement
- Future research
 - Practical implications of this and similar approaches
 - Build collaboration and apply the model for other countries

Acknowledgements



- Whole Building Whole of Life Framework
- Funding



