

INTEGRATED CARBON METRICS - A MULTI-SCALE LIFECYCLE APPROACH FOR THE BUILT ENVIRONMENT



PROJECT OVERVIEW



KEY POINTS

- **‘Embodied’ carbon in the built environment contributes an additional 18 per cent towards Australia’s overall emissions**
- **We are developing a suite of carbon accounting tools that provide a complete picture of the carbon lifecycle, at the building, precinct and city level.**
- **The tools can inform more effective planning strategies to reduce carbon.**

THE OPPORTUNITY

Buildings produce a significant amount of carbon in their day-to-day use, with operational emissions from the built environment contributing an estimated 20 per cent towards Australia’s annual national total. Carbon mitigation strategies and standards developed by industry and government generally focus on these ‘direct emissions’.

Another important part of the picture is the carbon emissions created during other stages of a building’s life, such as in the production of materials and in construction. This ‘embodied’ carbon contributes an additional 18 per cent towards Australia’s overall emissions, making it an important focus for new research and an enormous opportunity to boost built environment carbon reductions.



CRC for Low Carbon Living

We are a national research and innovation hub that seeks to enable a globally competitive low carbon built environment sector and is supported by the Commonwealth Government’s Cooperative Research Centres (CRC) programme.

With a focus on collaborative innovation, we bring together property, planning, engineering and policy organisations with leading Australian researchers. We develop new social, technological and policy tools for facilitating the development of low carbon products and services to reduce greenhouse gas emissions in the built environment. For more information visit www.lowcarbonlivingcrc.com.au/

OUR RESEARCH

Our Integrated Carbon Metrics (ICM) project is building knowledge about both the direct and indirect carbon emissions in the building process, to better inform those making decisions about our future built environment.

Our research team is developing carbon accounting tools that can be scaled to the building, precinct or city level, to provide a holistic picture of the carbon lifecycle in the Australian built environment.

In particular, our project is developing:

- A database of information about the carbon embodied in different construction materials used in Australia.
- A carbon flow analysis tool, which can track emissions along production and supply chains and show in detail how different industries contribute to carbon emissions.
- A 3D Precinct Information Modelling tool, which can calculate and visualise carbon emissions during the planning of precincts.
- A precinct lifecycle energy modelling tool, based on low carbon scenarios.
- A framework to help link lifecycle assessment and costing for buildings.
- City Carbon Footprinting, to provide a picture of the embodied carbon emission flows in and out of cities.

VALUE PROPOSITION

These decision support tools are intuitive, scalable and can be used in combination with existing carbon assessment tools. They will assist building designers, manufacturers, planners and developers in the future planning of our buildings, precincts and cities. By arming them with comprehensive information about how carbon is created over a building's lifecycle, the ICM project can inform more effective planning and mitigation strategies to reduce carbon, helping to meet national targets.

What's more, they will be open source and publicly available, meaning they can be continually updated with new information by the people using them and working across the sector.

PROJECT PARTNERS

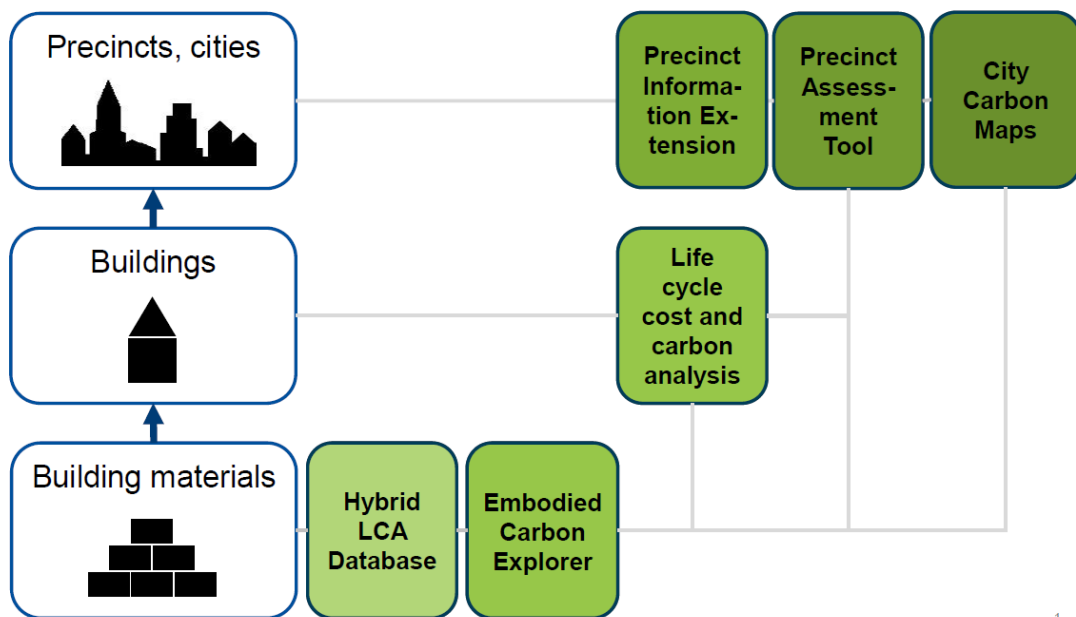
- University of Melbourne
- University of New South Wales
- University of South Australia
- AECOM
- Aurecon
- BlueScope
- Sydney Water



18% of Australia's embodied carbon emissions are from:



Levels of Carbon Emissions and Project Tools



FURTHER INFORMATION

Built environment professionals and project teams can trial and tailor our tools.

To access them, or for more information about this project, please contact:

Project leader: Associate Professor Tommy Wiedmann
E: t.wiedmann@unsw.edu.au

Project manager: Ms. Judith Schinabeck
E: j.schinabeck@unsw.edu.au