



Circular Economy — evidence-informed policy development

Building the future with circular solutions.
RDA Event | Penrith NSW 22 August 2023

Dr Tom Alves

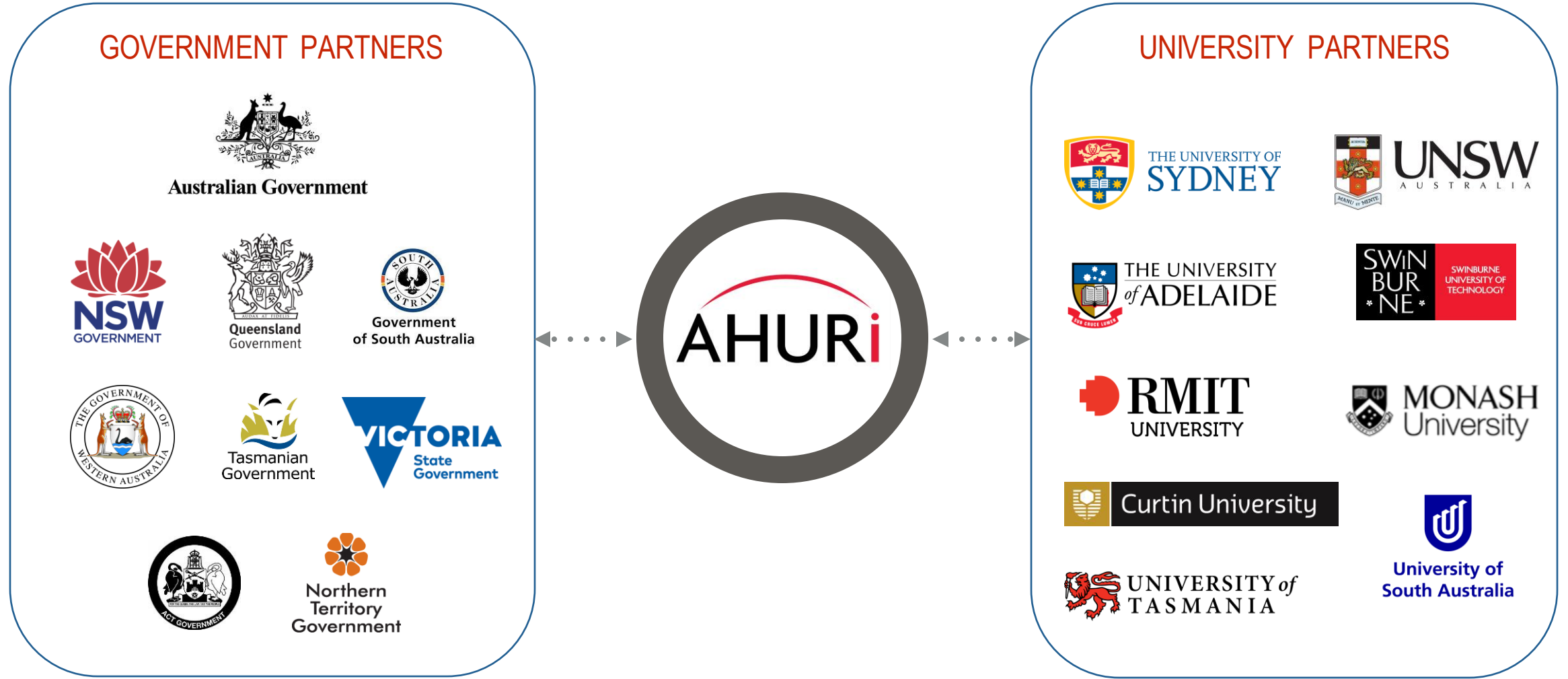
AHURI policy development research model

National Housing Research Program

- Category 1 research funding
- High quality peer reviewed research
- National research agenda – directly informed by policy makers
- Approx. 20 reports per year
- Inquiry into circular economy housing
- Funded 2021 – 5 reports released 2023

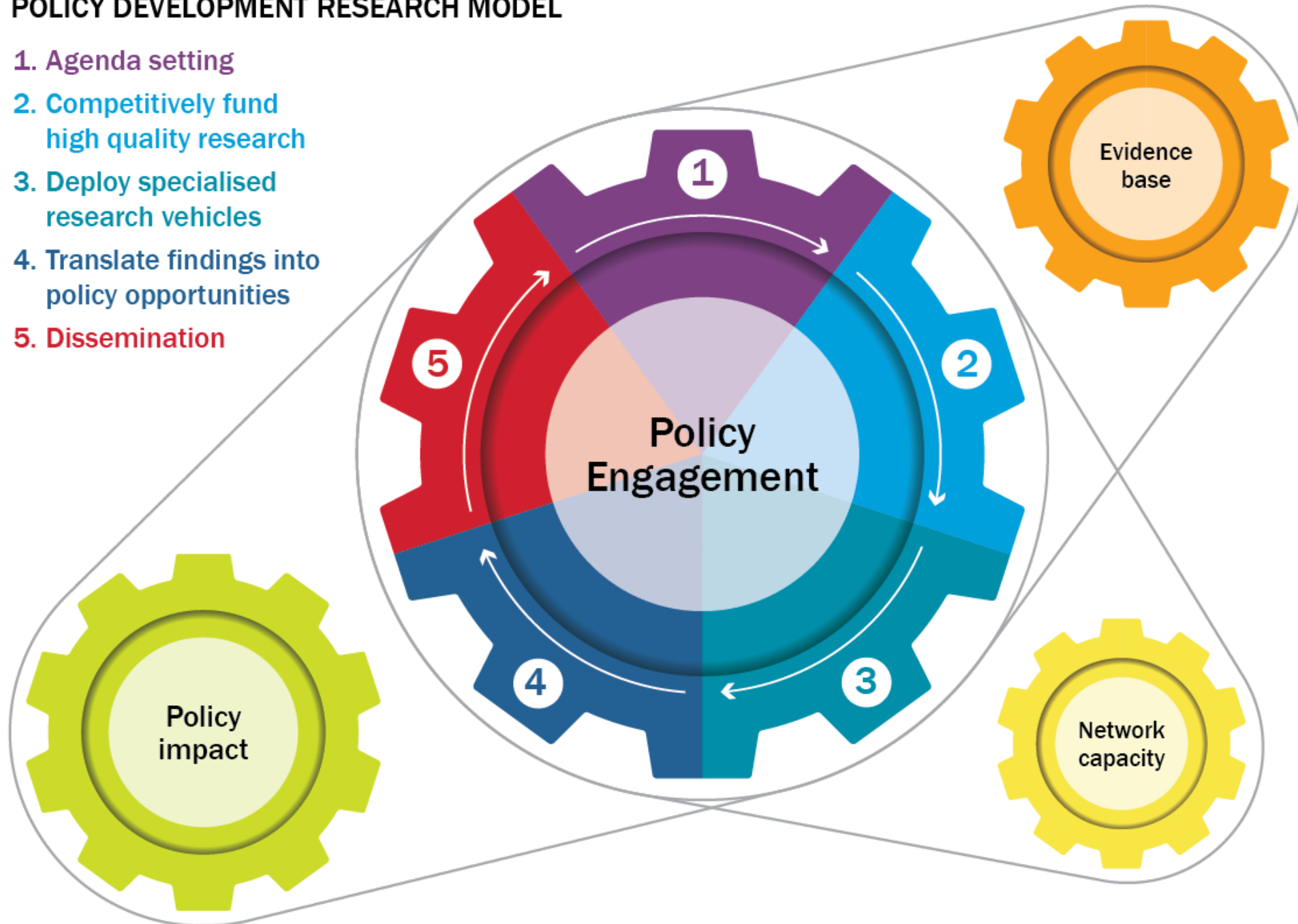


AHURI research partners



POLICY DEVELOPMENT RESEARCH MODEL

1. Agenda setting
2. Competitively fund high quality research
3. Deploy specialised research vehicles
4. Translate findings into policy opportunities
5. Dissemination



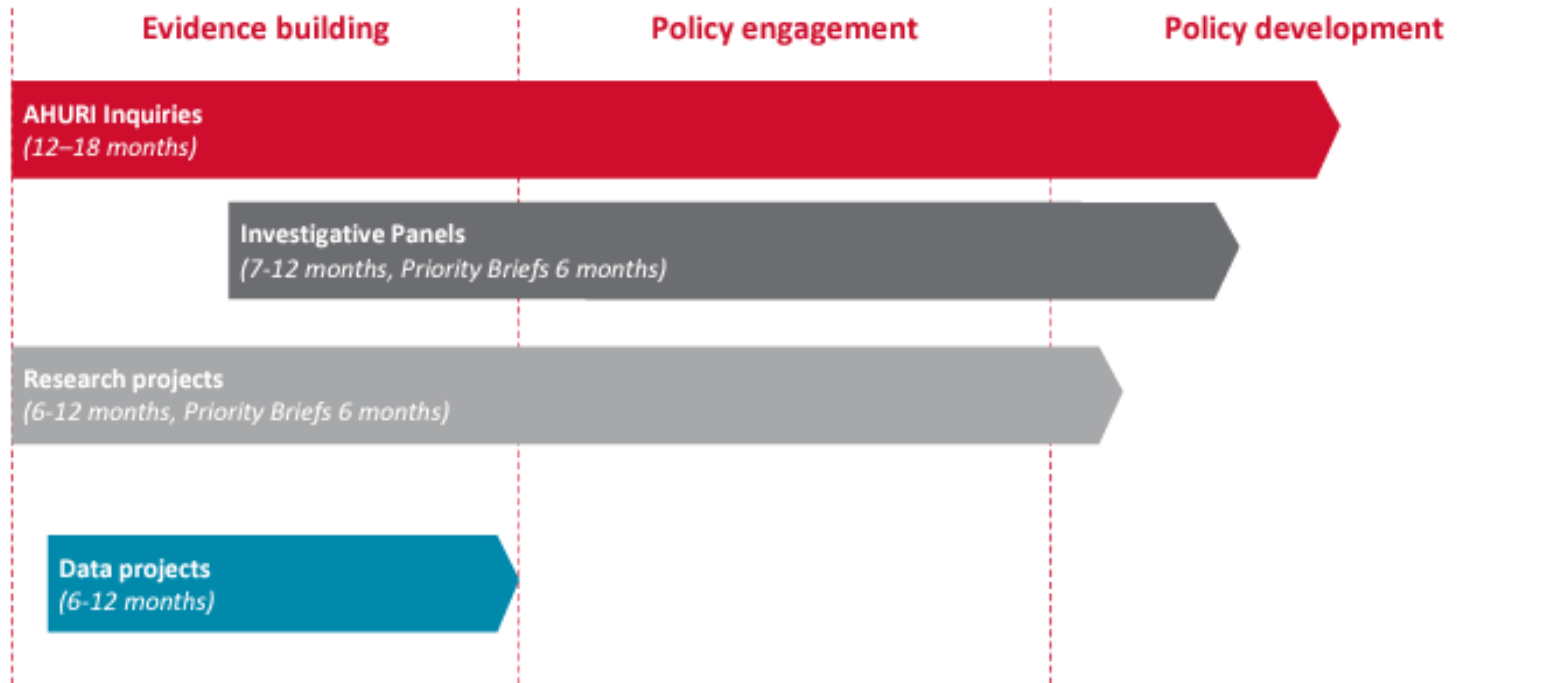
Policy development research model

AHURI Inquiry – Housing in a Circular Economy

- Building evidence and developing policy as one process
- High level of collaboration between research and policy and practice communities
- Collaboration occurs through **AHURI Inquiries** - integrated suites of research activities, supported by an expert panel
- Panel members made up of policy makers, practitioners, and industry professionals – helps to focus the relevance and value of the research
- Communication is outwards facing
- Attuned to external policy conversation

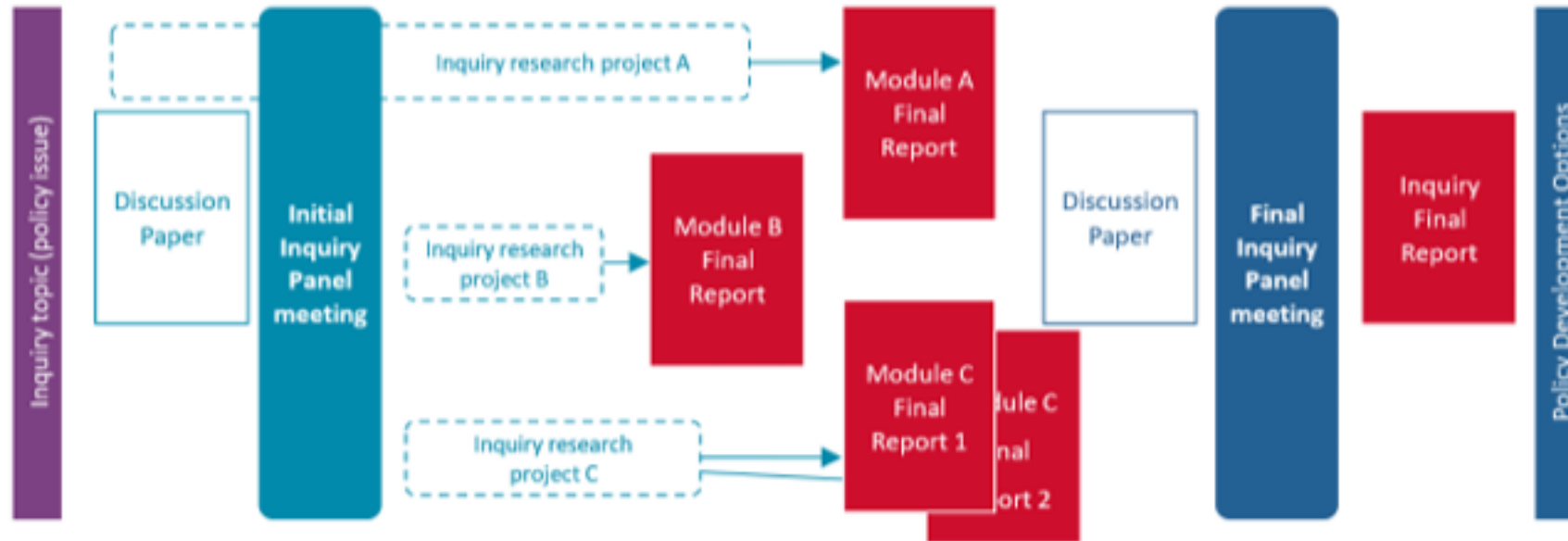
Policy development research models

AHURI Inquiry – Housing in a Circular Economy



AHURI Inquiry into circular economy and housing

Typical Inquiry program



AHURI Inquiry into circular economy and housing

Project 1: Sustainable housing at a neighbourhood scale

- Published 13 April 2023 (Dühr et al.)
- This study investigated the challenges and opportunities that built environment professionals in Australia experience when planning, designing, and implementing sustainable housing developments at the neighbourhood scale.
- It also examined strategies and policy levers employed in case study eco-neighbourhoods from across Australia and in Europe to inform future Australian policy and practice.



AHURI Inquiry into circular economy and housing

Project 2: Sustainable social housing retrofit? Circular economy and tenant trade-offs

- Published 4 May 2023 (Baker et al.)
- This research examines the preferences and trade-offs of tenants during social housing retrofit programs, particularly regarding implementing circular economy (CE) practices.
- The study looks beyond consideration of energy efficiency, to respond to broader requirements of the social housing sector—to incorporate and balance tenant needs with provider mandates, budget limitations, and wider social policy.



AHURI Inquiry into circular economy and housing

Project 3: Delivering sustainable apartment housing—new build and retrofit

- Published 8 June 2023 (Easthope et al.)
- This research investigates how Australia can supply new and retrofit older apartments so that they are sustainable.
- Sustainable apartments are comfortable, deliver cost reductions for households, minimise consumption and waste, maximise energy efficiencies and energy management (both in construction and throughout their lifecycle), include the adoption of renewable energy technologies.



AHURI Inquiry into circular economy and housing

Project 4: Building materials in a circular economy

- Published 22 June 2023 (Dalton et al.)
- This research analyses the supply chains of manufactured building materials used by the residential housing industry to assist the housing industry in reducing greenhouse gas (GHG) emissions.



AHURI Inquiry into circular economy and housing

Final Inquiry Report: Informing a strategy for circular economy housing in Australia

- Published 29 June 2023 (Horne et al.)
- The final Inquiry report informs a strategy to facilitate CE housing: from construction, through operation to demolition.
- A comprehensive CE strategy will:
 - lift sustainability as a priority
 - shift market processes
 - tilt incentives to attract the appropriate investment
 - build capacities towards circular and sustainable outcomes



Final Inquiry Report: Informing a strategy for CE housing in Australia

Definition

- Housing produced and consumed using closed-loop principles
- Prioritising local employment
- Resilient and functional design
- Carbon-neutral and/or energy-efficient operation

- Important to avoid negative trade-offs



Final Inquiry Report: Informing a strategy for CE housing in Australia

Cross-cutting insights

- Recognise the dynamic and differentiated composition of: (a) housing industries, (b) material supply chains, (c) housing consumption.
- Direct consumer demand for CE goods and services is weak for many reasons, including market failures, and split incentives.
- Australia can learn from previous projects, as well as from new developments in prefabrication and building practices.
- A CE strategy must include politically astute vision, robust legal footing, industry-relevant application, and capable enforcement.
- Specialist investigation of Australian institutional settings, market processes, and stakeholder capacities is required to propose suitable instruments for local conditions.

Quadrant framework

Identify needed change and necessary interventions



Reappraising value

Reappraising value: value inclusion and prioritisation, market setting, institutional frame



Shaping markets

Shaping market practice and processes: regulatory/steering instruments, performance-drivers, market-shapers, etc.



Tilting investment flows

Tilting investment flows: finance, capital and tax incentives



Building capacity

Building capacity: skills, knowledge, and training

The construction sector was responsible for 18.1 per cent of Australia's carbon footprint in 2013.

Building materials in a circular economy

Methodology

- Review of the literature
- Model residential housing system material stocks and flows
- Interview key personnel in two residential case studies
- Analysis of the institutional arrangements underpinning use of three building materials: concrete, steel, timber



Building materials in a circular economy

Key findings – general

- The nature of the housing industry and resistance to change
 - Two distinct sectors with innovation slow and dispersed
- Embodied GHG in new building materials is increasing
 - 2007–2019 new materials used in construction are more than double the flow of waste out
- Building material flow patterns are complicated and obscure
- Barriers exist to seeing construction and demolition waste as a valuable resource
 - Large data gaps are a barrier to identification and quantification of materials in use



Apartments are 18 per cent more carbon-intensive than houses.

Building materials in a circular economy

Key findings – materials

- Concrete the main contributor to carbon intensity of apartments
- Steel production accounts for ~ 8% of GHG emissions
 - Use has increased – especially as concrete reinforcing
- Timber is a low-emission biomaterial
 - Industry supply chains are resistant to change
 - Seen as demolition waste rather than resource





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