

EXECUTIVE SUMMARY

FINAL REPORT NO. 403A

Informing a strategy for circular economy housing in Australia



From the AHURI Inquiry: Inquiry into housing in a circular economy

Authored by

Ralph Horne, RMIT University

Louise Dorignon, RMIT University

Julie Lawson, RMIT University

Hazel Easthope, UNSW

Stefanie Dühr, University of South Australia

Trivess Moore, RMIT University

Emma Baker, University of Adelaide

Tony Dalton, RMIT University

Hal Pawson, UNSW

Peter Fairbrother, University of Tasmania

Publication Date June 2023

DOI 10.18408/ahuri5328001

Title

Informing a strategy for circular economy housing in Australia—Executive Summary

Authors

Ralph Horne, RMIT University
Louise Dorignon, RMIT University
Julie Lawson, RMIT University
Hazel Easthope, UNSW
Stefanie Dühr, University of South Australia
Trivess Moore, RMIT University
Emma Baker, University of Adelaide
Tony Dalton, RMIT University
Hal Pawson, UNSW
Peter Fairbrother, University of Tasmania

ISBN

978-1-922498-70-0

Key words

Circular economy, sustainability, decarbonisation, closed-loops, reuse, just transition, social housing retrofit, apartments construction, building materials, neighbourhoods, durability.

Series

AHURI Final Report

Number

403a

ISSN

1834-7223

Publisher

Australian Housing and Urban Research Institute Limited
Melbourne, Australia

DOI

10.18408/ahuri5328001

Format

PDF, online only

URL (full report)

<https://www.ahuri.edu.au/research/final-reports/403>

Recommended citation

Horne, R., Dorignon, L., Lawson, J., Easthope, H., Dühr, S., Moore, T., Baker, E., Dalton, T., Pawson, H. and Fairbrother, P. (2023) *Informing a strategy for circular economy housing in Australia*, AHURI Final Report No. 403, Australian Housing and Urban Research Institute Limited, Melbourne, <https://www.ahuri.edu.au/research/final-reports/403>, doi: 10.18408/ahuri5328001.

Related reports and documents

Baker, E., Moore, T., Daniel, L., Caines, R., Padilla, H. and Lester, L. (2023) *Sustainable social housing retrofit? Circular economy and tenant trade-offs*, AHURI Final Report No. 397, Australian Housing and Urban Research Institute Limited, Melbourne, <https://www.ahuri.edu.au/research/final-reports/397>, doi: 10.18408/ahuri3128301.

Dühr, S., Berry, S. and Moore, T. (2023) *Sustainable housing at a neighbourhood scale*, AHURI Final Report No. 396, Australian Housing and Urban Research Institute Limited, Melbourne, <https://www.ahuri.edu.au/research/final-reports/396>, doi: 10.18408/ahuri3228101.

Easthope, H., Palmer, J., Sharam, A., Nethercote, M., Pignatta, G. and Crommelin, L. (2023) *Delivering sustainable apartment housing: new build and retrofit*, AHURI Final Report No. 400, Australian Housing and Urban Research Institute Limited, Melbourne, <https://www.ahuri.edu.au/research/final-reports/400>, doi: 10.18408/ahuri7128201.

Dalton, T., Dorignon, L., Boehme, T., Kempton, L., Iyer-Raniga, U., Oswald, D., Amirghasemi, M. and Moore, T. (2023) *Building materials in a circular economy*, AHURI Final Report No. 402, Australian Housing and Urban Research Institute Limited, Melbourne, <https://www.ahuri.edu.au/research/final-reports/402>, doi: 10.18408/ahuri5328401.

AHURI

AHURI is a national independent research network with an expert not-for-profit research management company, AHURI Limited, at its centre.

AHURI's mission is to deliver high quality research that influences policy development and practice change to improve the housing and urban environments of all Australians.

Using high quality, independent evidence and through active, managed engagement, AHURI works to inform the policies and practices of governments and the housing and urban development industries, and stimulate debate in the broader Australian community.

AHURI undertakes evidence-based policy development on a range of priority policy topics that are of interest to our audience groups, including housing and labour markets, urban growth and renewal, planning and infrastructure development, housing supply and affordability, homelessness, economic productivity, and social cohesion and wellbeing.

Acknowledgements

This material was produced with funding from the Australian Government and state and territory governments. AHURI Limited gratefully acknowledges the financial and other support it has received from these governments, without which this work would not have been possible.

AHURI Limited also gratefully acknowledges the contributions, both financial and in-kind, of its university research partners who have helped make the completion of this material possible.

The illustrations in the AHURI Inquiry: Inquiry into housing in a circular economy were done by Zhen Xiong, RMIT University.

Disclaimer

The opinions in this report reflect the views of the authors and do not necessarily reflect those of AHURI Limited, its Board, its funding organisations or Inquiry Panel members. No responsibility is accepted by AHURI Limited, its Board or funders for the accuracy or omission of any statement, opinion, advice or information in this publication.

AHURI journal

AHURI Final Report journal series is a refereed series presenting the results of original research to a diverse readership of policy makers, researchers and practitioners.

Peer review statement

An objective assessment of reports published in the AHURI journal series by carefully selected experts in the field ensures that material published is of the highest quality. The AHURI journal series employs a double-blind peer review of the full report, where anonymity is strictly observed between authors and referees.

Copyright

© Australian Housing and Urban Research Institute Limited 2023

This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License, see <https://creativecommons.org/licenses/by-nc/4.0/>.



Executive summary

Key points

- Given the urgency to decarbonise Australian housing, the housing industry needs support to shift practice to deliver more sustainable housing outcomes.
- The circular economy (CE) concept calls for closed-loop material flows that minimise environmental burdens, while also delivering social and intergenerational equity, local economic opportunities and resource efficiency (Geissdoerfer, Savaget et al. 2017; Kirchherr, Piscicelli et al. 2018).
- Drawing on evidence from four interconnected Research Projects, this overarching Inquiry report informs a strategy towards CE housing.
- The starting point of this report is recognising the distinctive structure and actors across the housing industry, with varying capacities to respond to such a strategy (Dalton, Dorignon et al. 2022).
- To ensure a just transition to CE housing that creates decent work and housing opportunities, a cross-sectoral and multi-institutional approach is required (Mazzucato 2014; 2018a; 2018b).
- This Inquiry proposes a quadrant framework for CE housing. This comprises four components to be progressed in tandem: reappraising value and prioritising sustainability, shaping markets for a sustainable purpose, tilting investment flows, and building capacity.
- The quadrant framework amounts to a coordinated suite of policy and supporting measures across the housing system, as outlined in this Inquiry report.

Key findings

- Currently, policy frameworks and processes do not support the implementation of a circular economy (CE) across the housing industry. In the face of the climate crisis and the housing affordability crisis, the shift to CE housing is urgently needed and requires multi-directional effort.
- Low or unspecified standards, adverse actor motivations and incentives, up-front costs (despite long-term cash benefits) to investors and consumers, as well as a lack of professional awareness and training inhibit the adoption of CE for housing in Australia in different fields of action: the neighbourhood; apartment construction and renovation of social housing; as well as across building materials supply chains.
- The widespread adoption of high quality, durable, low-impact, low-risk materials and maintenance systems aligned to extend asset life is held back by additional up-front costs, incomplete markets, and insufficient know-how and incentives.
- An array of interventions and instruments are required to address these deficiencies and support more sustainable homes and neighbourhoods—both retrofit and new-build. Combined interventions are required to ensure effective implementation and sustained outcomes. Strategies can vary in terms of coverage, often related to how centralised, comprehensive or bottom-up and diverse their application (Lawson and Dorignon 2021).
- While the design and composition of policy instruments is typically enacted and facilitated by governments, innovation and implementation necessarily involves industry and civil society participation. While metropolitan areas have the potential to make ‘key decisions determining economic growth, social well-being and environmental benefits’ (OECD 2020), a multi-level governance approach and robust national leadership—of the type seen in Finland and France—seems to offer a more comprehensive and less fragmented path towards CE.
- The qualities of strategic frameworks include a politically astute vision, robust legal footing, industry-relevant application and capable enforcement. Specialist in-depth investigation of Australian institutional settings, market processes and stakeholder capacities are required to inform suitable instruments adapted to local conditions.
- In the first instance, further reform of regulatory standards is needed, often in combination with fiscal and financial frameworks, business support schemes, and education and training.
- New partnerships between governments, private developers and local communities with suitable governance approaches will be required to implement more sustainable neighbourhoods and circular processes for production, use and reuse of goods and services (Dühr, Berry et al. 2023).
- There is great potential to improve the performance of new and existing apartment buildings through interventions that embed sustainability in the work of development teams, project feasibility, valuation and post-occupancy monitoring.
- Information on building sustainability, including common areas and services, can also inform the decision-making of residents and owner-managers (Easthope, Palmer et al. 2023).
- Retrofit of social rental housing competes for scarce budgetary resources. Building managers need to address the very real concerns of residents as well as the imperative to tackle climate change through CE housing reforms (Baker, Moore et al. 2023).
- Understanding the structure and conduct of building materials supply chains is essential for policy development seeking to reduce carbon intensity of new material choice and use in the housing industry (Dalton, Dorignon et al. 2022).
- Measures to increase housing and material durability, performance, reuse, recycling and resource recovery will require the development of new design and retrofit skills and practices, together with an efficient and responsive ‘used’ materials market (Dalton, Dorignon et al. 2022).

Policy development options

A CE approach can contribute to a more sustainable housing system. To achieve this requires a clear vision of the desired transformation in the most relevant fields, mobilising responsible leaders and engaging key stakeholders with the right regulatory frameworks, incentives, resources and capacities.

To drive change in the housing system requires an appreciation of the role of key actors. There is no evidence that housing industries are wilfully adopting or prolonging unsustainable practices. Rather, these unsustainable practices are sustained by gaps in market settings and institutional capacities. A comprehensive strategy is needed that applies relevant tools to:

- lift sustainability as a priority
- shift market processes
- tilt incentives to attract the appropriate investment
- build capacities towards circular and sustainable outcomes.

Recognising the complexity of the housing system, this Inquiry and associated four Research Projects focussed on key fields of:

- neighbourhood development
- apartment construction
- renovation of social housing
- construction materials.

These distinct but connected fields across the housing system involve multi-level forms of governance, specific ecosystems of activities and processes, diverse stakeholders, and varying skills and resources. To inform a strategy, this Inquiry identified relevant tools designed to drive circularity in each field. These tools involve strategic guidance, knowledge development, collaborative platforms, business support schemes, and regulatory frameworks, as well as purposeful public investment and taxation. While a strategy is needed that is specific to Australian housing, it also must reflect on best international practice, not only to catch up, but also to innovate and excel in Australian conditions.

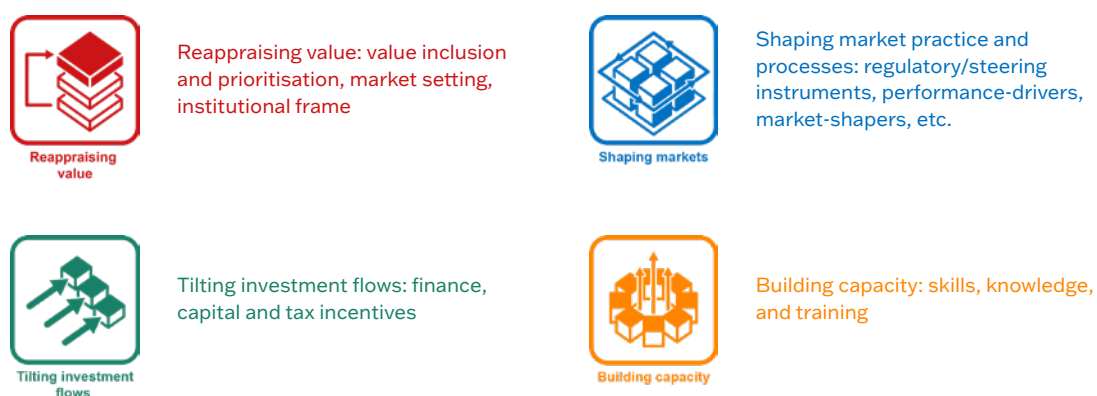
Radical decarbonisation is needed along with shifts in materials and practices. Simply relying on demand to drive the supply of circular goods and services would neglect the weakness of consumer voice and the nature of current supply chains—for example, about a third of all households are tenants, and have little influence on the material sustainability of their housing.

The findings from the Inquiry and the Research Projects suggest that effective change requires measures that actively shift perceptions of value and priority-framing in decision-making to those that favour CE housing outcomes. Housing industry organisations cannot meet this challenge without purposeful public intervention and stakeholder cooperation. This is not to absolve the housing industry from a key role in the transition. Indeed, it is critical that:

1. The housing industry steps up.
2. Leading CE practice is incentivised and supported.
3. Economy-wide changes are instituted on sustainability and carbon neutrality, which will reinforce shifting social structures, institutions, discourses and priorities across society.

The mutual reinforcement between the housing sector and society is central in a successful transition to CE housing. Figure 1 presents the quadrant framework emerging from these findings. It proposes four key areas for reform: reappraising value and prioritising sustainability, shaping markets for a sustainable purpose, tilting investment flows, and building capacity.

Figure 1: Quadrant framework for a CE housing strategy



Source: Authors

Greater awareness of CE, through strategic research and discussion of results—as well as through demonstration of good practices—can foster new professional norms that prioritise sustainability, circularity and decarbonisation. These values must inform leadership, training and sense-making, as well as the setting of targets and key assessment frameworks, such as procurement and auditing of assets, and reporting.

Regulation is essential to shape housing markets to reinforce CE approaches, from the micro level of building materials, to construction and ongoing maintenance, to the macro level involving precinct-level spatial planning. Alongside legislative reform, clear targets and performance standards need to be enforced by monitoring, as well as being made accountable via appropriate reporting systems that sustain improving practice.

To tilt circular investment flows to promote sustainable housing relevant to Australia, public sponsorship of industry best practice will be an essential instrument to showcase and raise standards. Accredited training and professional awareness-raising on the practice and advantages of CE housing could shift practices and attract additional investment flows. Furthermore, grants, incentives and subsidies have the potential to lever resources of investors, building providers, local communities and residents. Procurement policies will be an essential tool to shift commissioning practices and support major CE retrofit programs and foster CE market development.

Internationally, there are a wide range of financial and regulatory incentive mechanisms that can be drawn upon and applied in the Australian context, as well as innovation and capacity-building programs. Regulation of carbon and pricing is one mechanism to help with redirecting investment flows and de-risking CE housing investment. De-risking investment can be part of a mechanism of change. By providing certainty and commitment, as well as investment and demand in the CE housing system, the normalisation of CE housing is made realisable.

To support effective implementation, professional and skilled work is required, as well as digital systems, monitoring and enforcement. This will require rigorous engagement with the principles of economic and industry training policy, as well as review of how the economic processes and outcomes for workforces is measured.

The transition to a low-carbon construction sector will require a higher-skilled, reskilled and more diversely skilled workforce, and may imply the embrace of new or different business models. To facilitate a just transition, the uneven impact on the nature of work, industry practices, and the consequential impacts on the broader economy and society must be properly accounted for. To build capacity for a just transition towards CE housing, training and education is vital for key stakeholders, including policy makers and administrators, as well as private-sector actors across a range of trades and professions, from carpentry to finance to urban planning. Re-skilling, inclusive employment opportunities and fair work are all necessary, and present fresh opportunities for the industry.

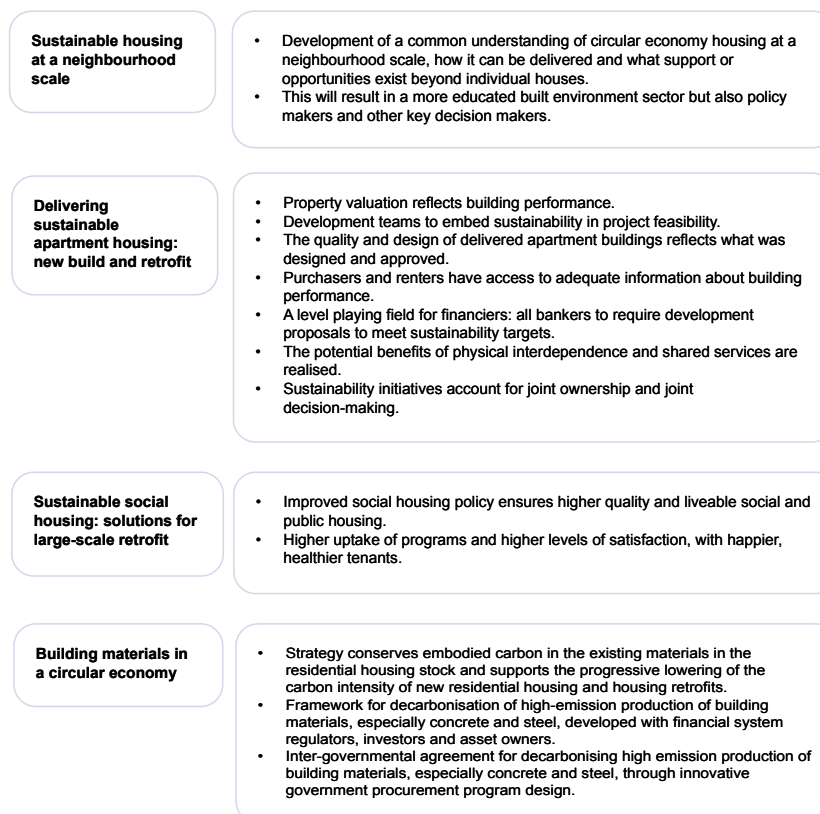
The scale of change required is significant. Specific industries, such as local government planning and the construction demolition industries are singled out for tailored capacity-building to catalyse reform, such as the development and use of material passports and preparation and application of precinct design guidelines to promote steps towards circular forms of development.

High-level principles to drive reform for each field (see Figure 2) and the tasks of responsible stakeholders (see Figure 3) are summarised below. Five policy development options are made to inform a strategy for CE housing in Australia:

- **Policy development option 1:** Adopt the quadrant framework.
- **Policy development option 2:** Set up a vehicle.
- **Policy development option 3:** Confirm goals and roles.
- **Policy development option 4:** Establish tools and phasing.
- **Policy development option 5:** Test and rollout action plans.

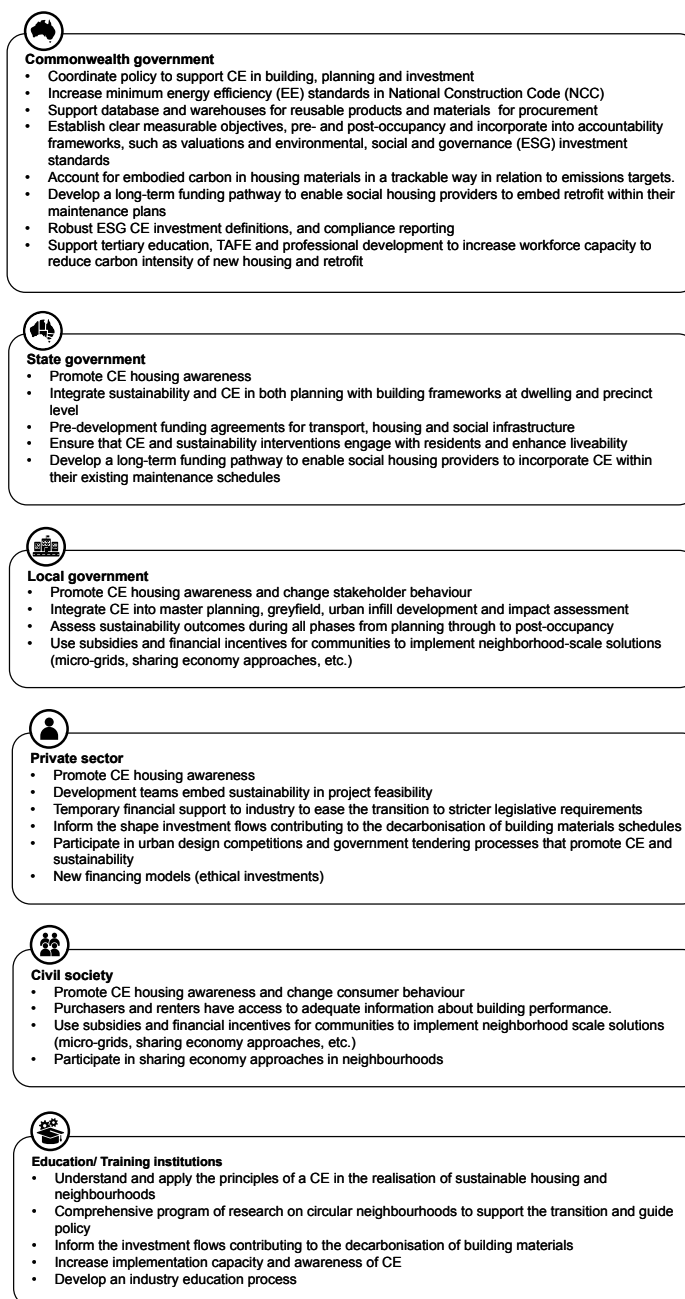
'The Policy Framework: Actions towards Circular Economy housing in Australia' provides quick-reference materials that can be used as an agenda for integrated action—to inform and guide conversations about the transition to CE housing in Australia. A Visual Summary is also available to illustrate the report's findings.

Figure 2: Focus and directions of reform for each housing field



Source: Dühr, Berry et al. (2023) ; Easthope, Palmer et al. (2023) ; Baker, Moore et al. (2023) ; Dalton, Dorignon et al. (2023).

Figure 3: Tasks for responsible leaders



Source: Dühr, Berry et al. (2023) ; Easthope, Palmer et al. (2023) ; Baker, Moore et al. (2023) ; Dalton, Dorignon et al. (2023).

The study

This Inquiry establishes a framework and evidence-base to support a transition to CE housing in Australia. It is informed by analysis of national and international data, industry and building practice, and key informant sources.

A shift towards CE housing depends upon the selection and enactment of appropriate levers for change, to guide transformation in the many linear processes involved in housing production. This Inquiry addressed the overall research question:

How can the transition to a circular economy in housing be implemented to provide more sustainable housing?

This question was examined via four Research Projects in different fields of action of the housing system. Each collected evidence and industry insights from the expert Industry Panel and from other experts and evidence from Australia and internationally. Each project had a different focus:

- **Sustainable housing at a neighbourhood scale:** This project identified opportunities for a CE approach at neighbourhood scale, to achieve a transition towards sustainable housing in urban infill and new-build development locations. The analysis considered geographical variation and learned from international progress to inform Australian policy makers.
- **Delivering sustainable apartment housing: new build and retrofit:** This project examined financial, fiscal, regulatory and policy levers that can facilitate a transition towards the mainstream supply of sustainable apartments in Australia. It did this by identifying processes—relating to financing, design and construction, and management—specific to the supply of new apartments and retrofitting existing apartments that impede or promote sustainability.
- **Sustainable social housing retrofit? Circular economy and tenant trade-offs:** This project investigated CE approaches to large-scale retrofits of social housing, and the implications for the broader housing and retrofit industry.
- **Building materials in a circular economy:** This project used a CE framing to investigate use and waste in material supply chains, to enable the housing construction sector to reduce, reuse, recycle and recover resources and rely much less on use of virgin materials.

In addition to five cross-cutting Inquiry research questions answered by lead experts in Scoping Papers, discussions with the expert Industry Panel also informed the four contributing Research Projects.



Australian Housing and Urban Research Institute

Level 12, 460 Bourke Street

Melbourne VIC 3000

Australia


+61 3 9660 2300

information@ahuri.edu.au

ahuri.edu.au

 twitter.com/AHURI_Research

 facebook.com/AHURI.AUS

 Australian Housing and Urban Research Institute