



VISUAL SUMMARY

Building circular economy housing: An Australian story

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Foreword

The idea of circular economy is often represented with abstract pictures of circles and closed loops. What does circular economy actually look like, and what does it mean when we think of Australian housing?

With this visual summary we offer real, tangible and relatable representations of circular economy principles as we explored them in our research. The story provides a condensed, illustrated view into our evidence base research project. It asks how circular economy can be implemented to provide more sustainable housing in Australia.

The visual summary is based on original and peer-reviewed research funded by the Australian Housing and Urban Research Institute (AHURI) and led by RMIT University. The research was informed by analysis of national and international data, industry and building practice, and key informant sources. It interrogated four key housing issues: neighbourhoods, apartments, social housing and building materials.

Find out more and access the full report at: <https://www.ahuri.edu.au/research/final-reports/403>

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We acknowledge the Traditional Owners of the land on which this story takes place, and we recognise the unique knowledge and contribution that Aboriginal and Torres Strait Islander people bring to housing and the built environment.

We also acknowledge that there are many Australian stories. The first stories were created by First Nations' people of Australia. In contrast, this particular story relates to contemporary settler housing produced over the last two hundred years on lands which were never ceded.

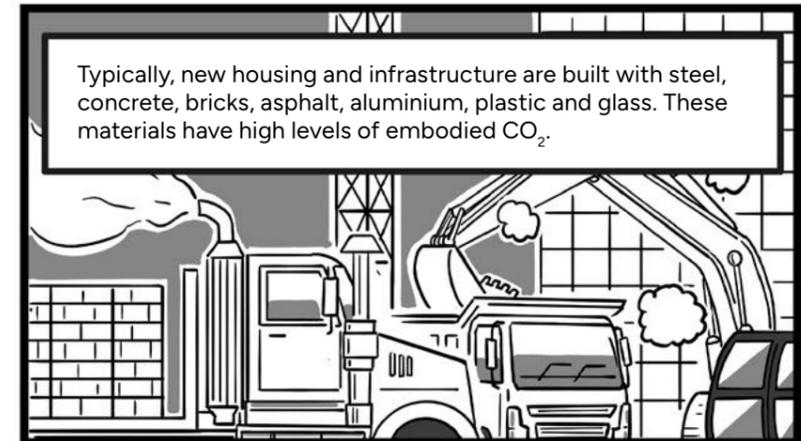


Hi, I am Sam, a builder in Australia. Let me tell you about how the housing industry could become more sustainable.



Housebuilding and renovating using manufactured building materials are a major contributor to global greenhouse gas emissions.

As urban populations grow the demand for housing will increase.



Typically, new housing and infrastructure are built with steel, concrete, bricks, asphalt, aluminium, plastic and glass. These materials have high levels of embodied CO₂.



Commitments to reducing greenhouse gas emissions globally and in Australia have been increasing, but more could be done. The housing industry needs support to shift practices to deliver more sustainable housing outcomes.

There are many problems associated with a linear economy, where finite resources are extracted, consumed, and discarded.

Furthermore, the housing industry is highly fragmented.

Adverse motivations, incentives and costs to investors and consumers inhibit the adoption of circular economy for housing in Australia.

Australian standards for building performance are currently very low in international comparison.

Additionally, there is a lack of professional awareness and training preventing progress towards a low carbon material market...

Cough! Cough!

For example, the adoption of durable and low impact materials is held back by high costs, incomplete markets, information asymmetries about split incentives, and insufficient know-how.

Waste-based bricks

Earth and natural fibre

Engineered bamboo

There is a real opportunity for Australia to progress towards a circular economy and provide more housing.

The concept of circular economy calls for closed loop material flows that minimise environmental burdens...

...while also delivering social and intergenerational equity, local economic opportunities and resource efficiency.

To ensure a just transition to circular economy that creates decent work and housing opportunities as the climate changes, we need a cross-sectoral and multi-institutional approach.

Organisations across the housing industry have varying capacities to respond to change.

Let's examine what instruments can be used across the fields of neighbourhood development, apartment construction, renovation of social housing, and construction materials.

There are many benefits to going beyond the building scale. Considerable scale efficiencies can be realised by planning, designing and building housing, energy networks or water management systems at neighbourhood scale.



This approach may also strengthen social sustainability in neighbourhoods

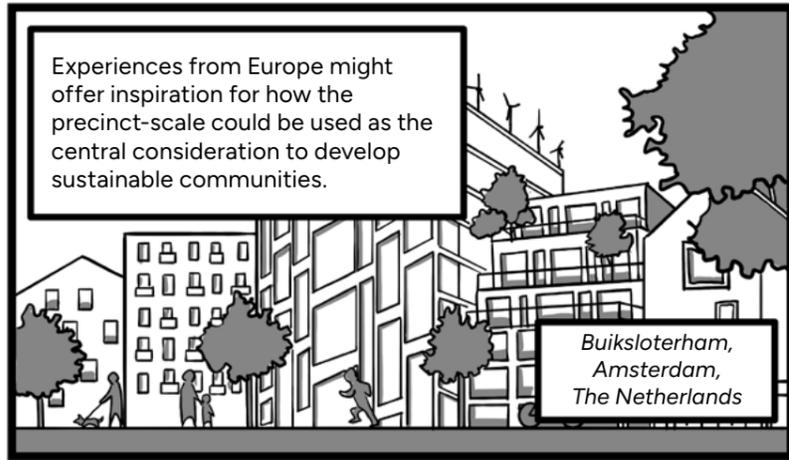


Despite a growing number of eco-precincts, these developments mostly focus on the building scale and the potential of the neighbourhood scale is underused.



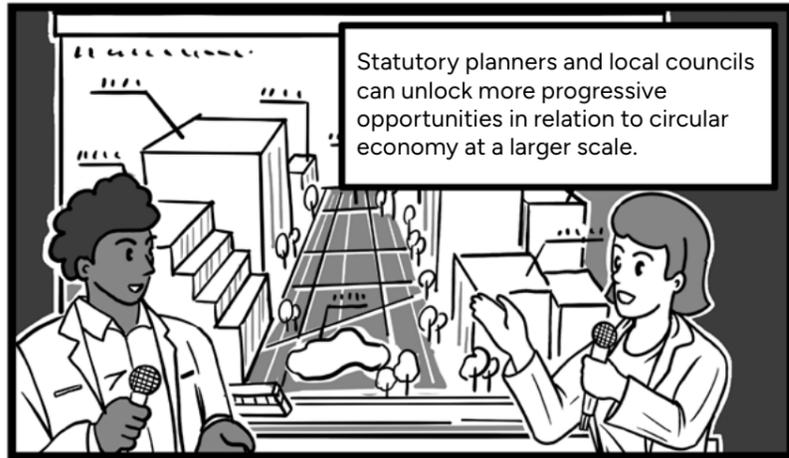
White Gum Valley, Western Australia

Experiences from Europe might offer inspiration for how the precinct-scale could be used as the central consideration to develop sustainable communities.



Buiksloterham, Amsterdam, The Netherlands

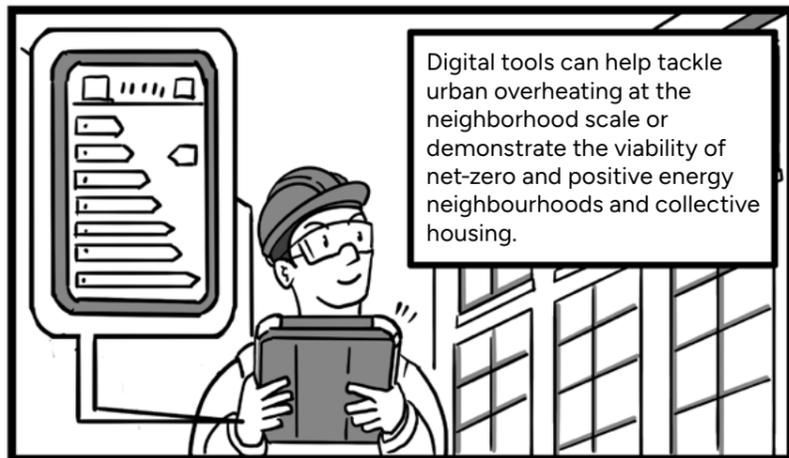
Statutory planners and local councils can unlock more progressive opportunities in relation to circular economy at a larger scale.



New models for community engagement, beyond statutory requirements, would be useful to ensure that eco-precincts can thrive.



Digital tools can help tackle urban overheating at the neighborhood scale or demonstrate the viability of net-zero and positive energy neighbourhoods and collective housing.

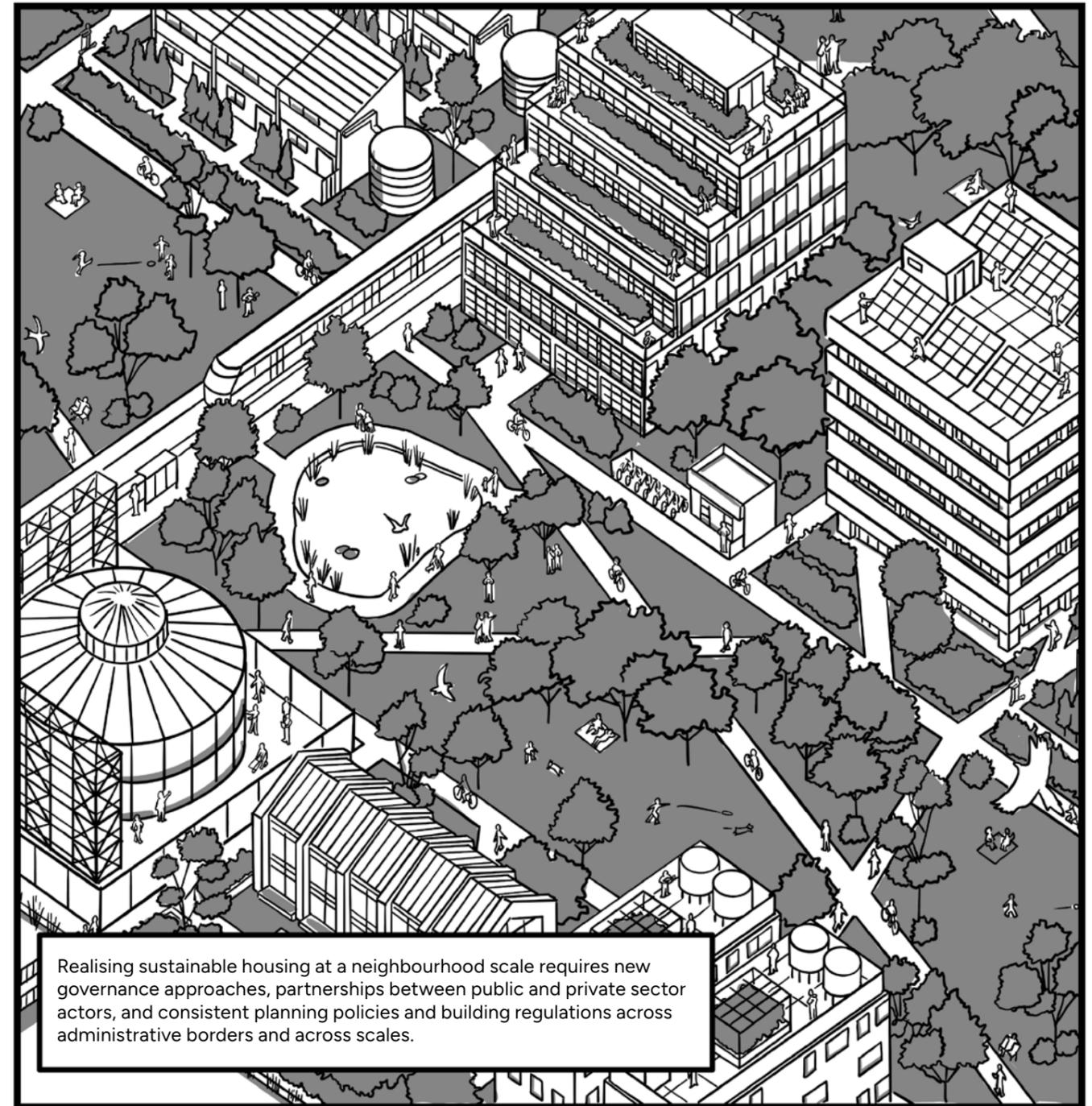


How to facilitate circular economy housing at the neighborhood scale?



Measures to de-risk circular economy precinct development include sharing cases of successful approaches, standards and streamlined planning and development processes.

Ginninderry, ACT

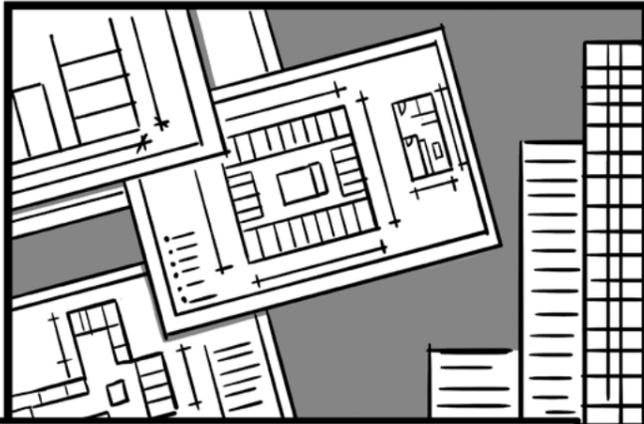


Realising sustainable housing at a neighbourhood scale requires new governance approaches, partnerships between public and private sector actors, and consistent planning policies and building regulations across administrative borders and across scales.

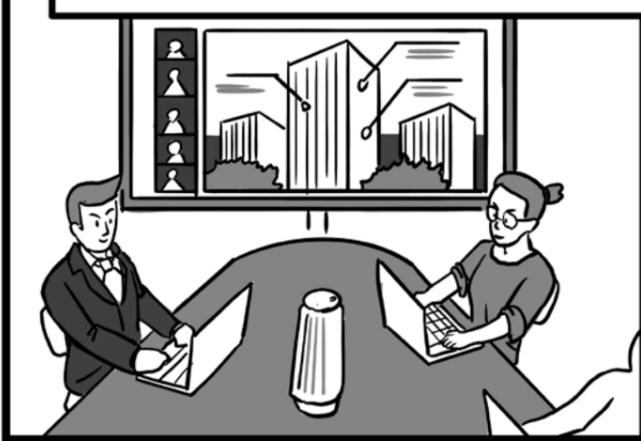
Few apartment building projects contain sustainability features that exceed minimum standards, despite residents and owners wanting more sustainable apartments.



Speculative strata title development does not incentivise practical shared services and efficiencies in apartment buildings, so their potential benefits are often not realised.



The performance of new and existing apartment buildings could be improved through standards and practices to embed sustainability in the work of development teams at the project feasibility stage.



Measures to improve building energy performance include a more widespread use of renewable energy systems and measures to optimise the thermal quality of the building envelope.

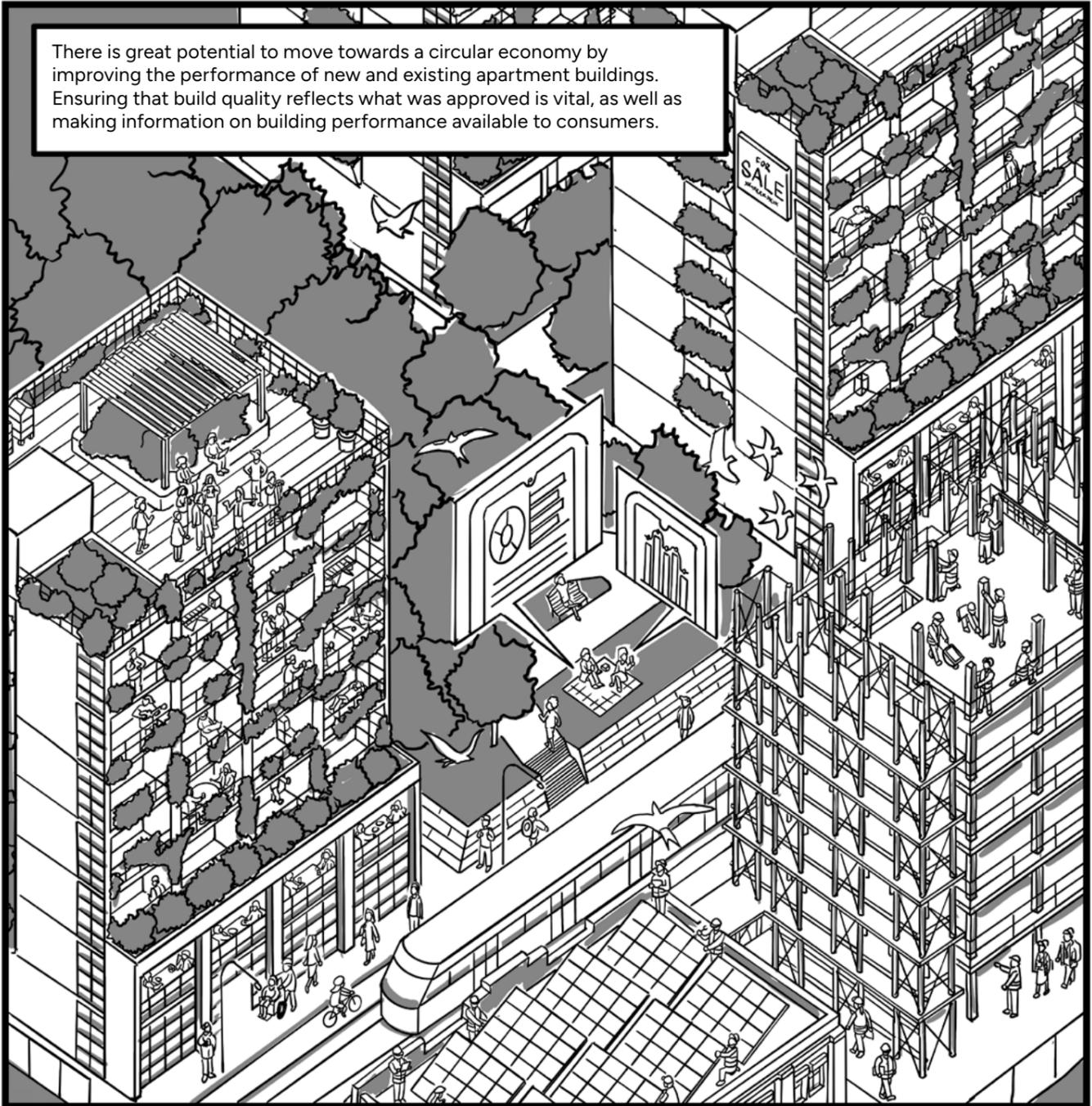
Property valuation processes that take better account of building performance over time would facilitate consumer demand for greater sustainability, including for rental properties.



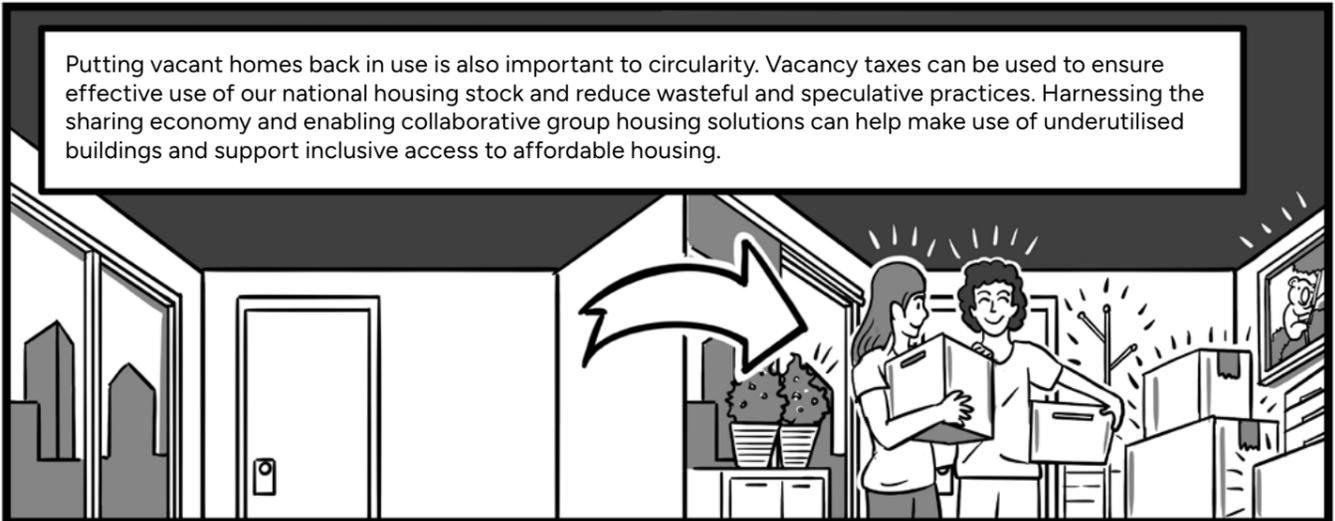
Purchasers and renters should have access to adequate information about building sustainability, including its common areas and services. Apartment residents must be considered and where possible included in sustainability initiatives that affect them.



There is great potential to move towards a circular economy by improving the performance of new and existing apartment buildings. Ensuring that build quality reflects what was approved is vital, as well as making information on building performance available to consumers.



Putting vacant homes back in use is also important to circularity. Vacancy taxes can be used to ensure effective use of our national housing stock and reduce wasteful and speculative practices. Harnessing the sharing economy and enabling collaborative group housing solutions can help make use of underutilised buildings and support inclusive access to affordable housing.



Retrofit to achieve circular economy goals has been mostly driven by market incentives directed towards middle-upper income homeowners.

Yet this focus has overlooked the fact that many Australians still lack access to even a basic quality of housing.

This has limited opportunities for large-scale retrofit that deliver the most efficient, cheapest and best outcomes.

Retrofitting social housing can reduce carbon emissions and improve energy-efficiency, whilst simultaneously improving building quality and residents' health.

Merton Regeneration project, Wimbledon, UK

This project aims to provide 2,800 new, quality homes by repurposing materials whilst reducing waste, carbon emissions and project costs through a circular economy framework.

Circle House Project, Lisbjerg, Denmark

Similarly, the Circle House Project integrated circularity and design for disassembly focus to create 60 housing units. However, both projects are focused on building process, rather than on creating efficient and high-quality homes.

Social housing providers have to balance business obligations with their social duty to assist residents: they must maintain often poor-quality dwelling stock, improve it and build more while relying on tied government funding.

Objectives underlying retrofit programs are rarely explicit and vary greatly between stakeholders. Often competing objectives of retrofit certainly limit successful retrofit outcomes.

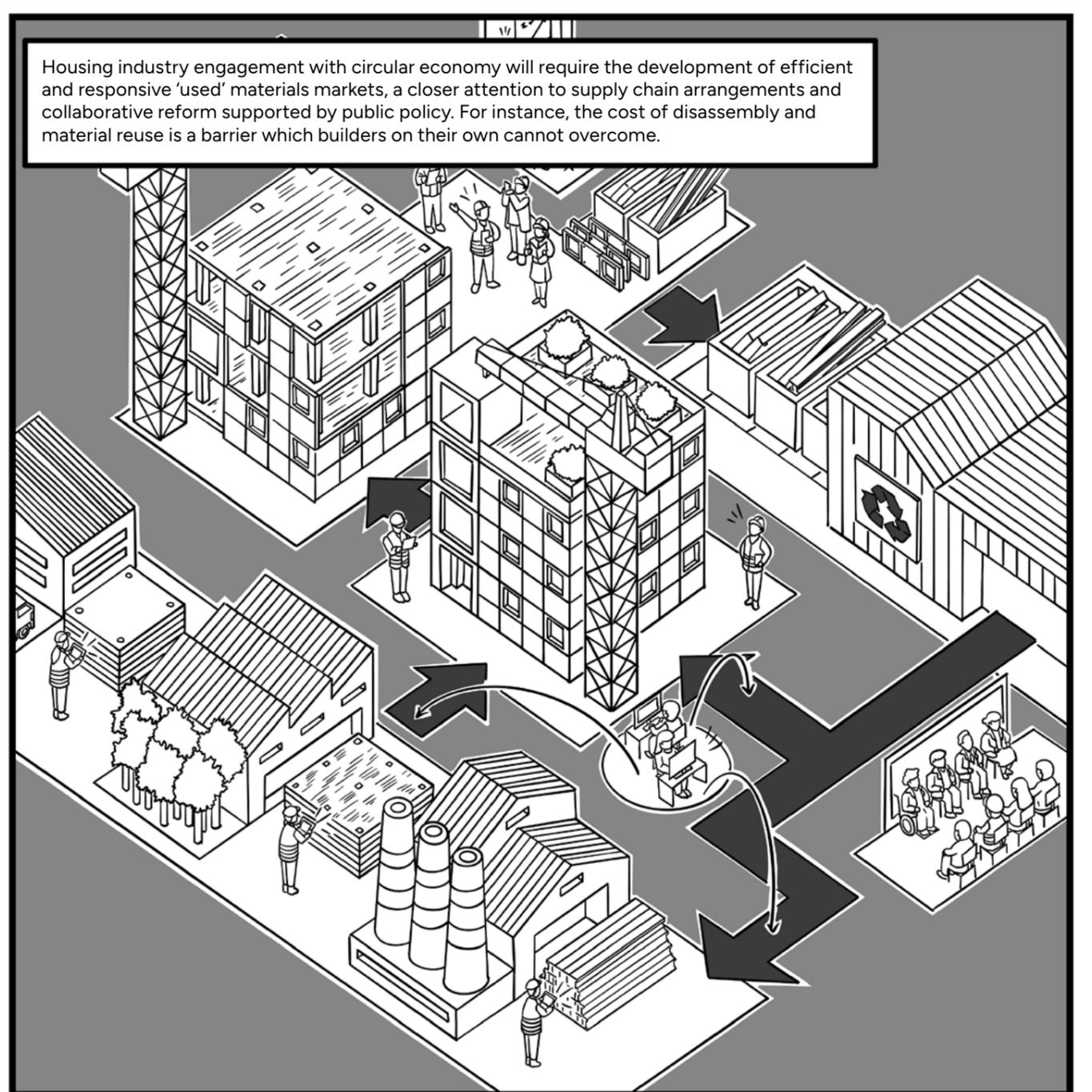
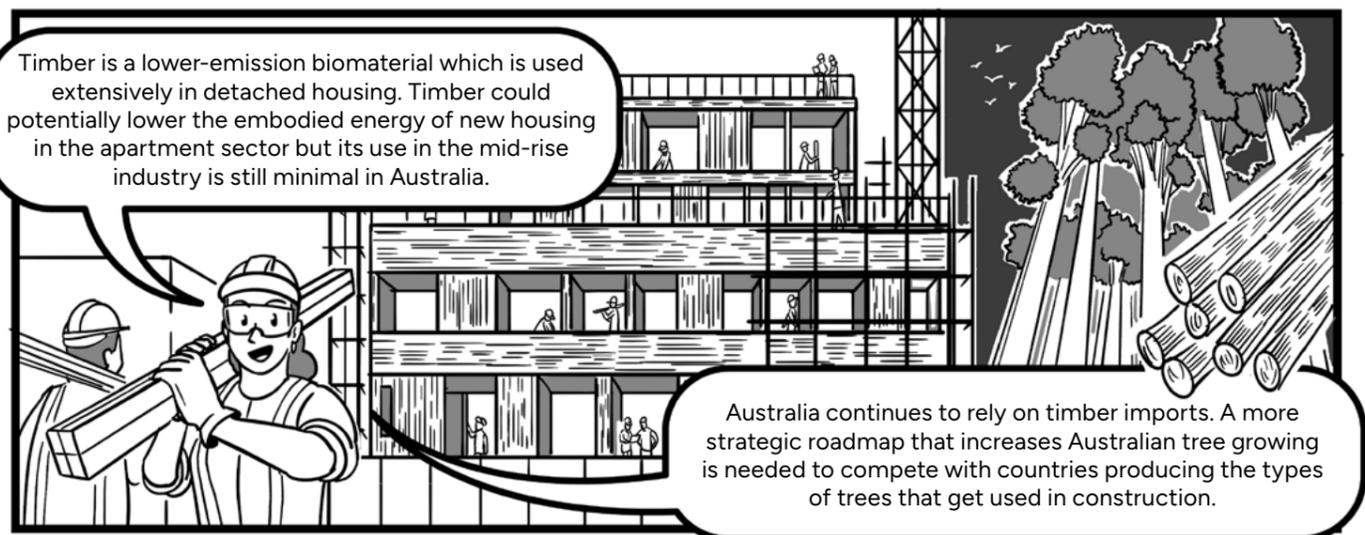
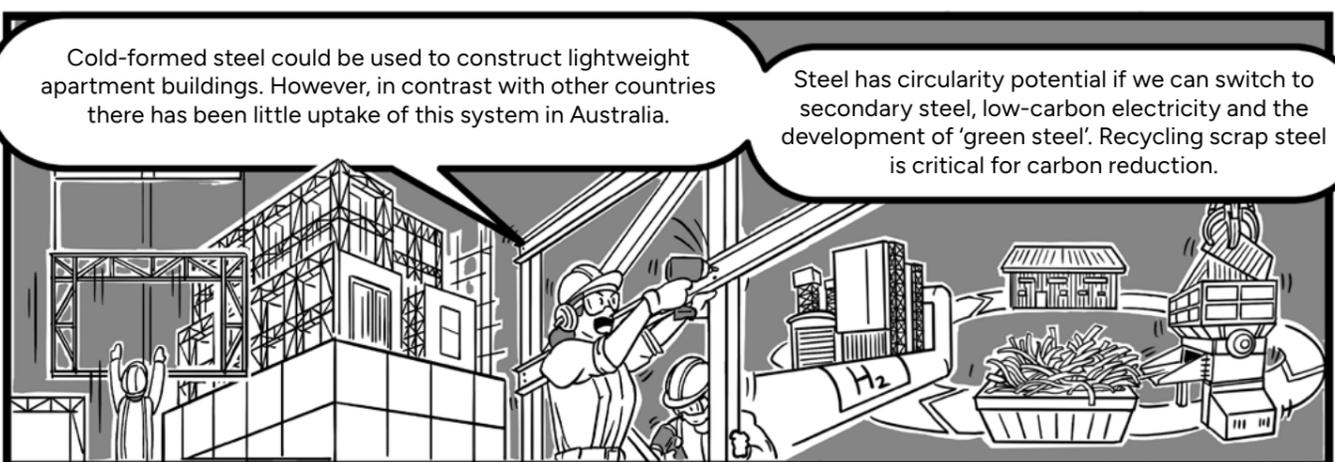
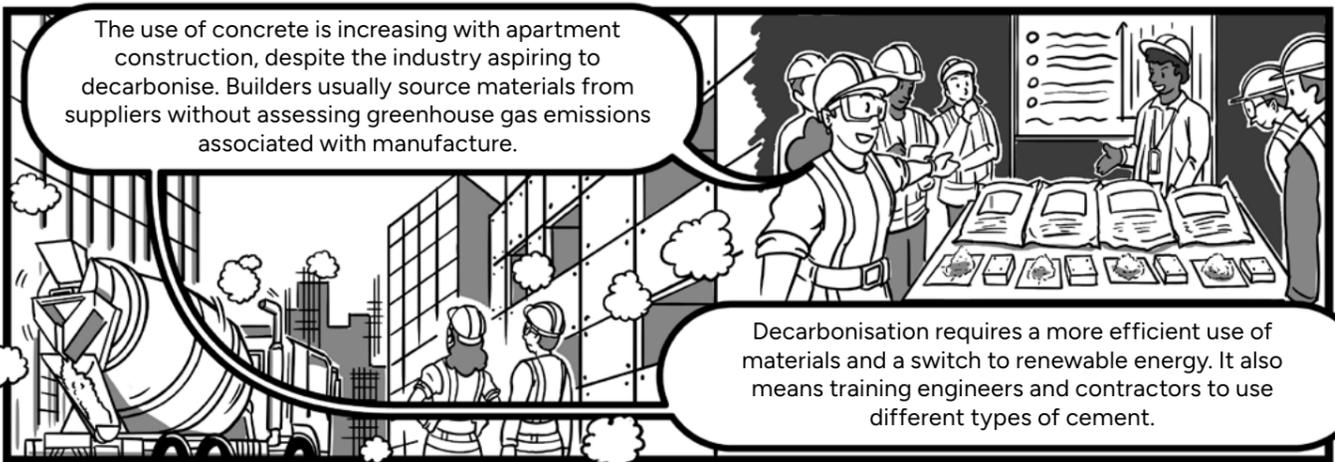
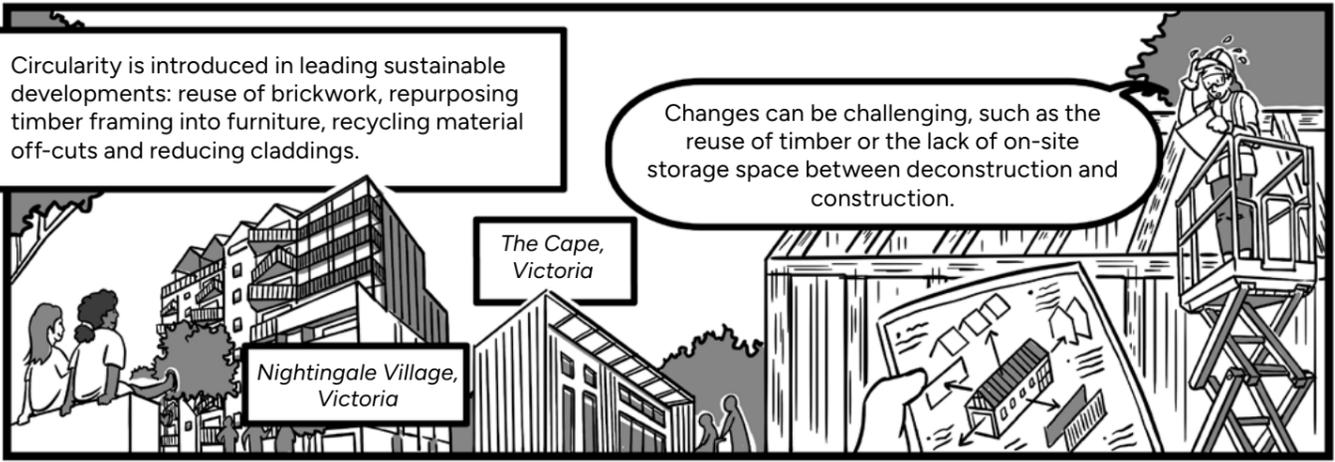
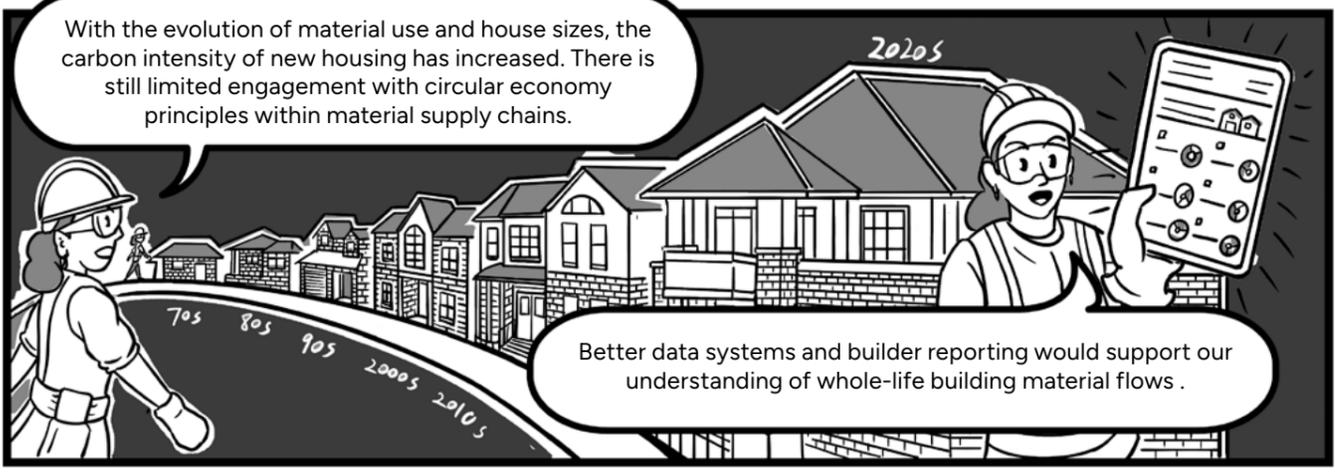
International best practice now includes the setting of minimum standards for social housing, including window coverings or heating and cooling systems.

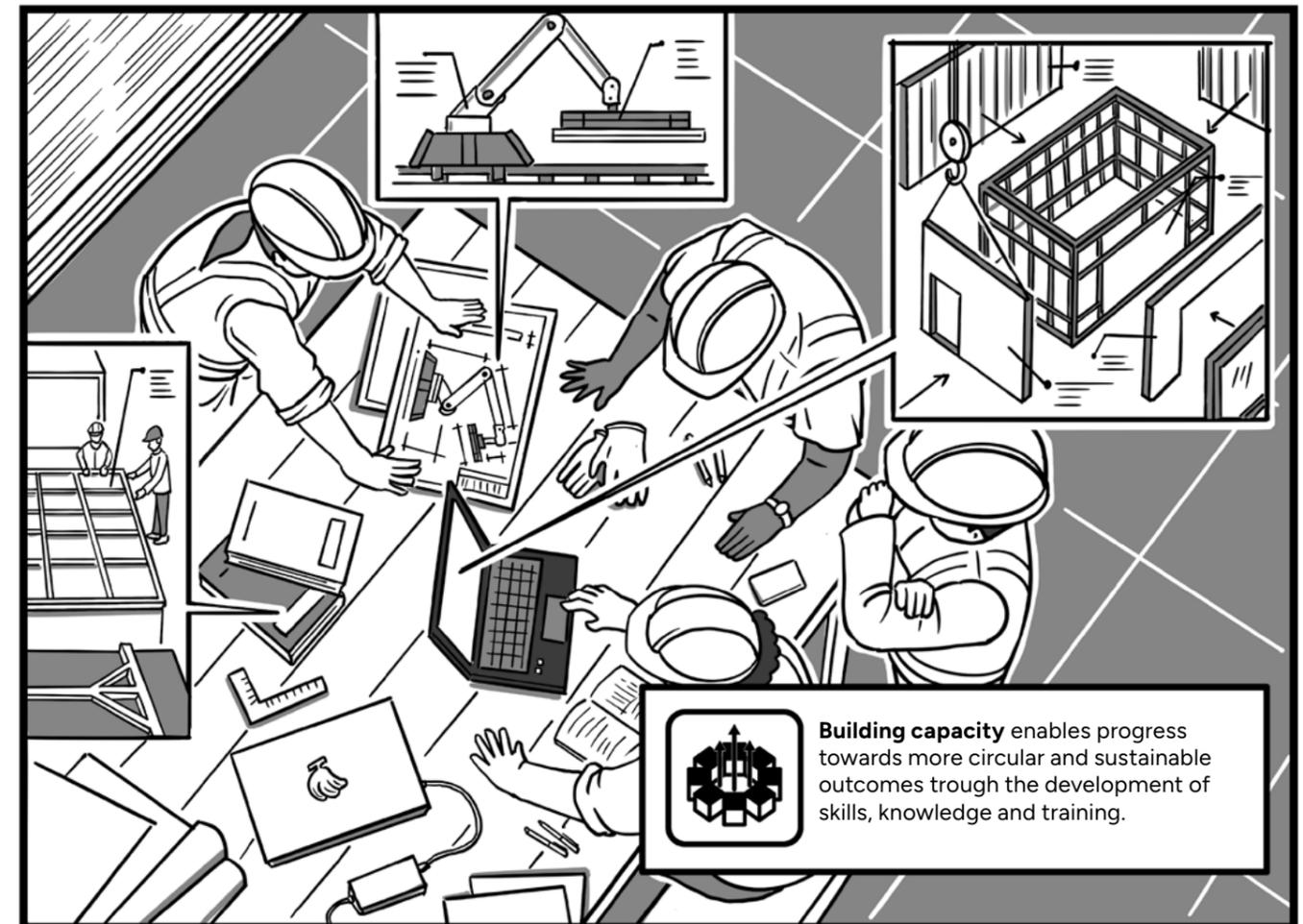
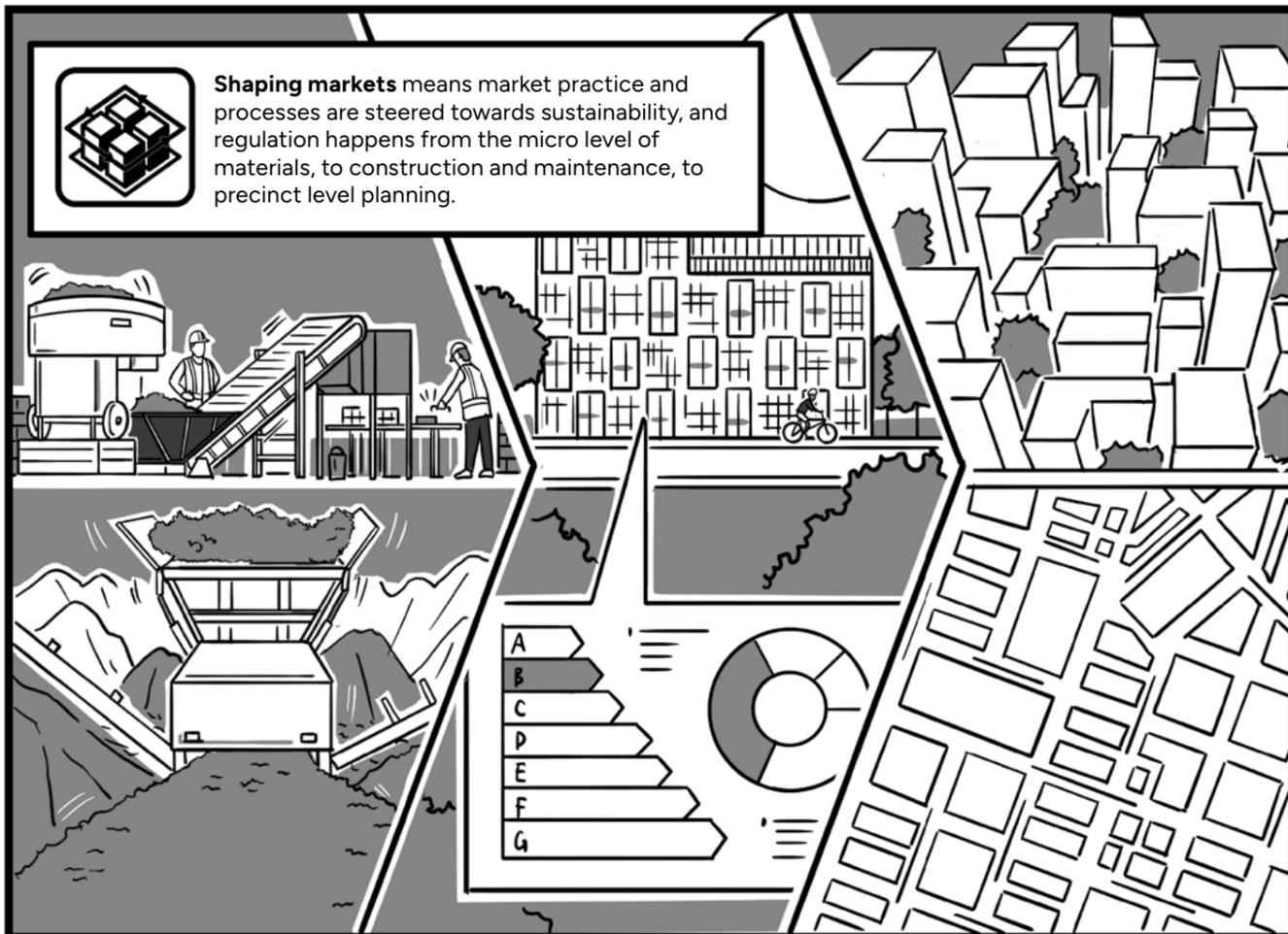
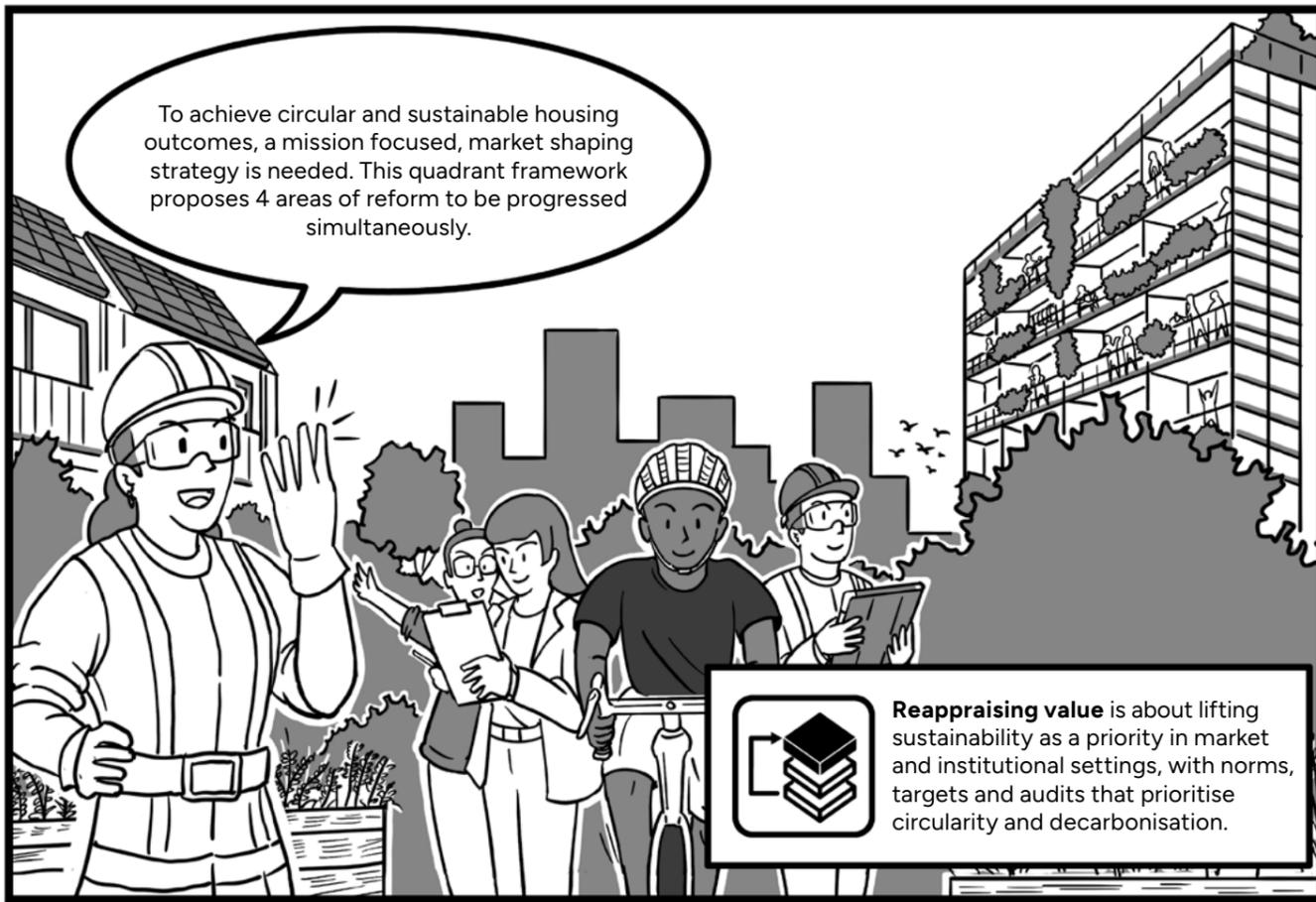
In New Zealand, these minimum standards are also linked to wider social benefits such as health. Any development or revision of minimum standards should include requirement for basic quality and liveability.

Lower income housing tenants and mortgage holders have no alternative than to live in whichever home they can afford. This is generally poor-quality housing where bills are higher. Everyone should have access to sustainable retrofit.

longer-term funding pathway for upgrades + industry advice = strategic coordination + improved energy costs and living environment for tenants

The retrofit of social rental housing is a major opportunity to test and advance circular economy housing, but competes for scarce budgetary resources and is held back by lack of clarity and transparency. Funding for social housing retrofit and quality upgrades would benefit from a longer-term funding pathway and industry advice around sustainability. This funding could then be accessed by social housing providers to reduce energy costs and improve tenants' living environment.





Circular economy housing is a social project as much as a regulatory reform.

Engagement and cooperation across all levels of government, civil society, private sector and education and training institutions is crucial.

Everyone has a role to play.



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This story illustrates how a transition to a circular economy in housing can be implemented to provide more sustainable housing in Australia.

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