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INQUIRY INTO PLANNING SYSTEM AND THE IMPACTS OF CLIMATE CHANGE ON THE ENVIRONMENT AND COMMUNITIES

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Australian Institute of Architects

INQUIRY INTO THE PLANNING SYSTEM AND THE IMPACTS OF CLIMATE CHANGE ON THE ENVIRONMENT AND COMMUNITIES

NSW Parliament – Legislative Council – Planning and Environment

SUBMISSION BY THE NATIONAL POLICY, ADVOCACY & EDUCATION TEAM

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ABOUT THE INSTITUTE

The Australian Institute of Architects (Institute) is the peak body for the architectural profession in Australia. It is an independent, national member organisation with around 14,500 members across Australia and overseas.

The Institute exists to advance the interests of members, their professional standards and contemporary practice, and expand and advocate the value of architects and architecture to the sustainable growth of our communities, economy and culture.

The Institute actively works to maintain and improve the quality of our built environment by promoting better, responsible and environmental design.

The Australian Institute of Architects recognises the unceded sovereign lands and rights of Aboriginal and Torres Strait Islander peoples as the First Peoples of these lands and waters.

This recognition generates acknowledgement and respect for Aboriginal and Torres Strait Islander Countries, Cultures and Communities, and their ways of being, knowing and doing.

Caring for Country practices including architecture and place shaping have existed on this continent since time immemorial.

The Institute recognises a professional commitment to engage and act meaningfully through reciprocal partnership and relationships with Aboriginal and Torres Strait Islander peoples.

Together we will support and develop the emergence of new possibilities for our shared future.

PURPOSE

- This submission is made by the Australian Institute of Architects (the Institute) to provide input on the impacts on the planning system from climate change

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TERMS OF REFERENCE

The Institute refers to the Terms of Reference (ToR) for the NSW Parliamentary Inquiry into the planning system and the impacts of climate changes on the environment and communities. This ToR has been retrieved from : Terms of reference.pdf (nsw.gov.au)

That Portfolio Committee 7 inquire into and report on how the planning system can best ensure that people and the natural and built environment are protected from climate change impacts and changing landscapes, and in particular:

- developments proposed or approved:
    - in flood and fire prone areas or areas that have become more exposed to natural disasters as a result of climate change,
    - in areas that are vulnerable to rising sea levels, coastal erosion or drought conditions as a result of climate change, and
    - in areas that are threatened ecological communities or habitat for threatened species
- the adequacy of planning powers and planning bodies, particularly for local councils, to review, amend or revoke development approvals, and consider the costs, that are identified as placing people or the environment at risk as a consequence of:
    - the cumulative impacts of development, (ii) climate change and natural disasters,
    - biodiversity loss, and
    - rapidly changing social, economic and environmental circumstances
- short, medium and long term planning reforms that may be necessary to ensure that communities are able to mitigate and adapt to conditions caused by changing environmental and climatic conditions, as well as the community's expectation and need for homes, schools, hospitals and infrastructure
- alternative regulatory options to increase residential dwelling capacity where anticipated growth areas are no longer deemed suitable, or where existing capacity has been diminished due to the effects of climate change
- any other related matters

[Climate risk hazards]

For the purpose of this paper, all bushfire, flood, drought, air pollution, acute heat or cool wave, flooding are referred to as 'predicted climate risk hazard(s)' unless specifically identified for elaboration.

INTRODUCTION

1.1 Long term effects on the community of climate risk hazards in Australia and community inequality

In 2020 Australia ranked in the top ten for countries with significant economic losses from climate related disasters[1] and which time, there was a large prevalence of those effected from bushfires in 2008, 2019 and flooding in 2010 and 2023. In Australia, the increased severity and frequency of natural disasters such as 'hurricanes, floods, bushfires, and droughts[2]' have further exacerbated the housing crisis and impacted economic recovery. Several years after these events, people and communities are still be affected through their mental, social and emotional health.

It was found in a four-year Australian study (1y pre-hazard and 3y post-hazard), that compared two scenarios between those not experiencing and those experiencing the effects of disasters:

- Mental health, social functioning and emotional wellbeing were all effected in the event year and possibly 1-2 years thereafter.
- Effects were greater in comparison for those who were already experiencing housing stresses and social equity
- Poor quality housing in the less social equitable space, experienced higher levels of severity than those in higher quality social housing
- Renters, those who completely lost their home or those with insecurity of housing, experienced higher impact from the disaster and were more likely to also need to move[3].

[1] The Lancet: Planetary Health: Li, A, Toll, M & Bentley, R. (2023) Health and housing consequences of climate-related disasters: a matched case-control study using population-based longitudinal data in Australia.
[2] Habitat for Humanity Australia (2023) Five ways Climate Change Impacts Housing Insecurity.
[3] The Lancet: Planetary Health: Li, A, Toll, M & Bentley, R. (2023) Health and housing consequences of climate-related distasters: a matched case-control study using population-based longitudinal data in Australia.

The study also identified the household profile noted the differences in equity including affordability based on similar income, fuel poverty, residential stability (i.e., renting) and the quality of the house[4].

RESPONSES TO SELECTED FOCUS AREA QUESTIONS

1.2 Developments proposed or approved in locations where there are predicted climate risk hazard(s)

While planning is often identified as a significant impediment to housing supply and diversity, its impact is often overstated by those seeking to remove necessary building standards and controls that ensure homes are liveable, suitable for our climate and are designed to meet the needs of residents. Therefore, the Institute warns that simplistic approaches to planning reforms should be ignored, particularly where they are focused on reducing quality outcomes.

Heat/Cool Risk impacts in planning affordable housing growth

The Institute has seen recommendations by some proponents that standards of energy efficiency, accessibility and climate adaptability should be removed or reduced for social and affordable housing to reduce the costs of constructing such housing. In relation 3.4 above, the Institute has set out the clear evidence that removing such requirements will:

- Treat those requiring social and affordable housing as second-class citizens
- Increase the lifetime costs to residents and governments through higher energy costs, need for costly rectification at later dates and the health costs of poor housing and the impact this has on individuals and government.
- Place significant risk to social and affordable housing tenants in terms of health and accessibility to thermally comfortable and homes with the ability of self regulation during acute heat and cool waves through increased building fabric provisions.

Where planning can impede is where it does not provide sufficient flexibility for new designs and ideas that have not been traditional used and approved. New technology and materials often advance faster than planning controls. This can lead to cookie-cutter outcomes.

The solution to ensure innovation, high standards, and lower costs is to use Design Review Panels (DRP) to review medium and high-density housing proposals. DRP are made up of experts who can quickly assess a design and determine whether it meets not just guidelines but the needs of tenants. While this may seem like adding an additional layer of regulation, it often leads to quicker decisions because the expertise on such DRP can quickly assess designs and make recommendations to ensure high standards are applied.

[4] Daniel, L, Baker, E, Beer, A. Bentley, R. (2023) Australian rental housing standards: institutional shifts to reprioritize the housing-health nexus

The best means to ensure better planning is to make sure it is overseen by experts with minimal to no political interference, whether at local government, State or Federal Government levels. Such experts are better equipped to deal with the complexities and to make decisions.

Flood, Bushfire and planning resilient communities away from climate risk hazards

Governments at all levels should be encouraged to work together to identify potential land outside those with predicted climate risk hazard overlays, that can be quickly repurposed to provide housing in an efficient and effective manner, particular where such is located close to jobs, health and education and public transport.

The Institute recommends:

- Need to identify potential underutilised land outside of climate risk hazard areas such as away from flood plains and areas needing significant vegetation maintenance for bushfires.
- State government and LGAs should work together to develop a database of underutilised land for each LGA, such as
    - Federal/State/Council Land
    - Unused schools, railway land, military land
    - Underutlised religious and charities land
    - Empty or underutilised commercial and industrial zones & Golf courses
    - Airspace - Commercial zones to become multi-use/residential above shops/Carparks/Rail corridors
- Review existing planning and building codes to ensure they provide the flexibility to provide housing in these types of locations, in particular, the adoption of multi-use zoning such that commercial and housing can be more easily co-located.
- Review minimum lot sizes with local councils to ensure infill sites are potentially more viable

How to encourage repurposing:

- Financial or other incentives
- Peppercorn rents in exchange for social and affordable housing
- Rezoning laws
- Bringing together landowners, financiers, builders and others to develop solutions f
- Government support for rehabilitation of land suitable for building if used for housing
- Mandatory densification requirements for LGA's

Droughts, extreme 1:100 events, and climate risk hazards from remoteness

Rural communities face unique issues of both climate and remoteness from services that are different from those in urban centres. Even then, within rural communities there are wide differences in climatic conditions due to vastness of the Australian land mass and the southerness of Tasmania. Rural communities are generally more remote from health services, which often have increases in demand that go with weather extremes. This remoteness from medical assistance makes it even more important that rural homes are properly designed for their localised climates, not just now, but what they face in the future.

In urban settings, relief can often be sought in commercial businesses such as shopping centres, cinemas and gaming venues, which provide a high level of air conditioning or heating.

Rural communities often lack ready access to similar locations and are thus, again, more dependent on their own home to provide relief from weather extremes.

Lessons can be taken from remote areas where there is significant drop in overnight temperatures, increased condensation and poor lifespan of constructions, poor portability or assembly due to remoteness in relation to trades and inability to mandate accountability of inspections during or after construction.

In addition to daytime temperature extremes, there is also significant night-time radiation in some remote and rural arid regions, simple terms, this night-time radiation occurs with clear skies overnight and radiation increasing the amount of surface temperature lost at night to the sky on non-porous materials, which makes surfaces cooler than the air temperature. On clear winter nights, building surfaces will become dew laden. This night-time chill will often result in more heating inside to keep warm due to the occurrence of longer, extreme weather events. This then creates a condensation risk, which diminishes the overall ability of the building to self-regulate between 18-22 degrees[5].

There is a need, therefore, in rural and remote areas to adopt a construction method that address particular climatic needs. In particular, construction methods and materials need to keep any condensation outside of the external weatherproof membrane and make the insulation, interstitial and interior surfaces more airtight. Alternatively, natural fibre methods such as strawbale and hemp, which are self-regulating, can achieve the same effect.

[examples of remote responses to climate risk hazards- heat/cool waves]

An architectural home in Victoria by Envirotecture called the 'Huff'n'Puff House'[6] uses such construction methods and provides climate resilience through using prefabricated strawbale panels. The walls are clad and ventilated externally, are bushfire and acute weather resistant, and the indoors has been made airtight using render to achieve a Passivhaus certification[7].

Prefabrication of homes or walls and other parts of a home, can, when done to proper standards of quality, design and material, provide a shortcut means of ensuring new housing is properly adapted to climatic needs. Such prefabricated homes can provide "refuge rooms" where occupants can escape the extremities within a more confined and energy-efficient room of the house.

[5] World Health Organisation (2018) WHO Housing and Health Guidelines
[6] Passivhaus Institute of Australia Database (2023) Huff n Puff House
[7] Passivhaus Database (2023) Huff'n'puff House, Envirotecture

The shortage of skilled workers and access to materials is felt even more in rural communities. Access to prefabricated homes or parts of a home could help to overcome some of these difficulties. Pre-built homes are not new to Australia nor regional areas. Even in the 19th century, prefabricated kit homes were popular for their relative cheapness and ease of building. A return to such building methods, though with a focus on quality and high material and environmental standards, could be one of the means to address how we make regional homes more prepared for our harsher climates.

The State government can assist in this process through:

- Being a builder of regional social and affordable housing and using that purchasing power to support pre-built homes and modular designs.
- Reduce any import tariffs and other impediments to the importing of machinery that is required to make such homes and parts of homes more efficient and of a higher
- Setting high standards for environmental standards and climate adaptability, which could spur demand for such types of housing

Biodiversity inclusion in whole site and community planning strategies for urban heat island effect

Vegetation can also play a big part in ensuring housing can remain naturally cool in summer and warm in winter. Ensuring rural homes are built to take advantage of their natural surroundings will provide a cost-effective means of minimising the weather and climate pressures on rural households. The Government should insist on high levels of natural cooling and temperature through design rules in regional areas that require taking into account natural surroundings to help achieve energy efficient and comfortable homes that require minimal mechanical intervention (air-condition and heating).

Urban Heat Islands because of decades of poor built environment regulation progression

The government needs to transition its approach for decarbonisation of the economy from silos of energy and the built environment. Instead, positioning housing as a vascular system to support and enable the economy to transition sectors such as manufacturing earlier than 2030. Energy efficiency improvements can result in NatHERS Star ratings, or energy efficiency, by using insulation materials appropriate for climate conditions.

Unfortunately, Australia largely still builds from its European roots. Cold and mild settled climatic conditions of Europe to designs and materials that are better suited to our divergent climatic needs and conditions.

For example, certain natural fibre insulation significantly increases star ratings by taking advantage of their ability to provide longer times for the acute heat and cool conditions to get to the inside of the building. This lowers operational emissions, while also being lower embodied carbon and improves the decarbonisation rate of the insulation manufacturing industry. The materials have provided positive outcomes for the United Kingdom[8].

The Government can encourage the uptake of energy efficient housing modifications by:

[8] Wood Knowledge Wales (2023)Why invest in woodfibre insulation manufacturing in Wales | Policy Briefing - Woodknowledge Wales

- Taking a 'building fabric first' approach, to store heat and coolth, prior to adopting alternative mechanical interventions.
- Promote insulation designed for the relevant local climate;
    - Promotion of the use of natural fibre insulation like hemp, cork, woodfibre, straw for our hot climate zones
    - the use of EPS, XPS and the typical lightweight foam insulations, for our cooler climate zones,
    - requiring more airtight building and mechanical ventilation due to the frequency of rain and humidity in wet and cold climate zones
    - Analysis of whether construction in Australia's most hot and arid regions, benefits from a continuous layer of insulation outside of the structural layer or should alternatives be available in those zones to avoid overuse of air-conditioning or overheating.

The Government can do more to support local manufacturing of building materials that both reduce carbon miles and ensure products are properly designed and used for our specific climatic needs and different climate zones. This could include support to use by-products of other construction elements so that there are efficiencies in logistics, manufacturing and the circular economy to reduce emissions further.

If the Government supports such sectors based on their appropriateness for the climate risk Australia faces, there are considerations for which materials are fossil fuel-based and needing to phase out of supply in favour of 100% renewable and natural fibre-based products.

1.3 Alternative regulatory options to increase residential dwelling capacity where anticipated growth areas are no longer deemed suitable, or where existing capacity has been diminished due to the effects of climate change.

Shifting provisions for rental housing stock

Healthy Homes for Renters shared their Community Sector Blueprint which provides characteristics for homes that support energy efficiency and minimum standards[9] in the transition of the sector to net-zero by 2050. In line with the governments targets to meet the Paris Agreement.

The Australian Federal Government has identified the need for existing housing energy efficiency upgrades for rentals in their Housing Australia Future Fund which supports homeowners receive incentives for improvements in 'operational energy efficiency' to keep homes 'warmer in winter and cooler in summer.[10]', such as:

- Battery-ready solar PV

[9] Healthy Homes for Renters (2023) Community Sector Blueprint
[10] Australian Government – Ministers Treasury Portfolio (2023) Helping Australians save energy, save on energy bills | Treasury Ministers

- Modern appliances
- Windows
- Insulation

However, such programs have the potential to replicate the failures of the 'pink batts insulation scheme'[11] if not executed with the lessons from that as well as similar reviews of programs in New Zealand[12] and United Kingdom's.

The Institute recommends further specific controls to be included in the Housing Australia Future Fund to cover all buildings but with considerable focus on the 11 million existing houses that will need some sort of upgrade.

There are several attributes commonly associated with rental situation that increase the risk of poor housing and energy efficiency and some which directly relates to findings in a New Zealand BRANZ study which noted:

- Lack of access to adequate drying facilities, and subsequently drying clothes inside.
- Broken/blocked mechanical ventilation due to low maintenance
- Lack of understanding about extraction of steam from showers during
- Overcrowding and higher number of occupants than bedrooms, creating more relative humidity inside, especially during winter when windows are closed
- Increase in dust and particles inside the home that provide a host for mould spores to grow due to poor airtightness and building sealing.

These considerations are:

- **Owners not maintaining existing homes used as rentals.** Often landlords keep maintenance low and return for the investor high, fenestrations have part of their openings permanently shut, avoiding the need for flyscreens and often without providing the same level of ventilation required for new homes under the National Construction Code Volume 2 (ventilation clause 10.6.2).

- **Mould that is not visible can still cause long-term physical conditions such as CIRS[13] and cognitive issues. Rental tenancy agreements should contain annual onsite moisture analysis undertaken as part of a quality assurance measure for tenant health and reduce economic health risks.** The Institute recommends that a quality assurance framework for rental sustainability standards would not be complete without adopting a quality assurance measurement (in home monitoring) for while the home is occupied. This is one of the most cost-effective and early identifiers of moisture conditions that can cause the levels of insulation to decrease and therefore risk from acute heat/cool shock.

[11] SBS News (2018) Kevin Rudd to face court in class action against failed insulation scheme | SBS News
[12] BRANZ & Analysis & Policy Observatory (2021) Indoor climate and mould in New Zealand homes (apo.org.au)
[13] Toxic Mould Support Australia (2020) Chronic Inflammatory Response Syndrome (CIRS) Explained - Toxic Mould Support Australia

Displacement of communities due to climate change disasters – assistance using 'design for manufacture, assembly and disassembly.

Helping people displaced due to climate disasters can be achieved through the use of, as previously identified for regional areas, more use of prefabricated houses, modular designs and building materials that can be built offsite to high standards in factories. Being factory built can provide a number of advantages over tradition house building:

- Manufacturing is not impacted by rain, heat or wind which can cause significant downtime for traditional builds
- Use a different labour force that is both less expensive and more readily available. Traditional builders are in short supply and competition for workers is intense, particularly because large, well-funded (and thus highly paid) construction workers are drawn away from traditional home builders. This labour shortage is even more acute in regional areas and those areas requiring rabid rebuilding of homes.
- Quality can be better controlled through quality assurance done in-house and the use of precision machinery. On site building quality can be difficult to control, as can the substitution of materials of lesser quality and durability.

Drive strategies for diversification hubs in housing at planning stages.

The same type of housing in the suburbs of infill development may have less tree canopy and biodiversity cooling the air around the building and surfaces. It may, therefore, have higher direct heat in summer on the surface of the walls and roof, then need a higher decremental delay, insulation (R) and alternative air-cooling services around the outside of the building, such as misting[14] which provides natural evaporative cooling[15].

1.4 Any other related matters

Consumer driven behaviour change as a compliment to concurrent reforms

The Institute also supports sector-wide education supporting consumer-driven demand. The GEER Report notes enablers for energy efficiency uptake are:

- disclosure of energy ratings;
- energy costs;
- providing internal upgrades such as LED lighting;

[14] Ulpiani, G & di Perna, C & Zinzi, M. (2020) Mist cooling in urban spaces: Understanding the key factors behind the mitigation potential

[15] Soltani, A & Sharifi, E (2017) Daily variation of urban heat island effect and its correlations to urban greenery: A case study of Adelaide.

- and education with rates notices on improvement pathways for rental/owner accommodation.[16].

South Australia's regional district Adapt West has introduced a free platform that predicts the NatHERS star ratings for homes (energy efficiency). Using AI it provides owners, tradespeople and others with a quick means to assess the actual energy efficiency of an existing home for sale or rent. Within the first few months this system provided:

- 8,029 predictions
- 1,999 optimisations
- 9,811 virtual tours
- 214 reports generated

This indicates there is a hunger and need for such tools and the federal government should consider supporting similar platforms on a national basis.

Operable shading and outdoor environment strategies should be available on all housing:

Internal shading such as blinds and gables can significantly reduce the heating and cooling requirements of a home for little cost.

Self-regulation by the building envelope.

This can be done with a materials-first approach and reduces the governments need for supporting services and infrastructure, environmental impact through more cradle-to-cradle approaches, lessens the need for maintenance and other sectors such as gas and electrification.

Increase 'as-built' quality assurance for new homes, and annual verification of performance on existing homes.

In 2023, Australia saw many volume housing providers liquidate, lost assets from poor quality assurance by the Victorian Building Authority, and various supply chains strained due to unpredictable pressure for certain materials that are assumed essential for the housing market. These assumptions are poorly considered regarding climate resilience and building sciences. Therefore, there is a large opportunity for government to mimic lessons from overseas with housing stock diversity provided through a quality assured framework of 'DfMA, and reuse'. At the same time, integration of mechanical services is often integrated during the sub-assembly off-site, as with Singapore's Construction Industry Transformation Map which highlighted their plans to integrate this methodology into an integrated planning process that harnesses existing design software being used by designers[17].

Australian Institute of Landscape Architects (AILA) Climate Positive Design Guidelines

[16] GEER (2017) /Driving-Change-What-caused-low-income-consumers-to-change-behaviour.pdf

[17] Singapore Government, Building and Construction Authority (2022) Design for Manufacturing and Assembly (DfMA)

The Institute cites the need for the integration of AILA's Climate Positive Design Guidelines into the planning system to provide mechanisms for measurement and mitigation of climate change.

We note, that AILA has made their own submission to this Parliamentary Inquiry and therefore the Institute makes no further comments based on Biodiversity, watershed integration and associated landscaping recommendations.

CONCLUSION

The Institute believes that government need to immediately commence adopting migration from climate risk hazard areas through mapping and overlays in the planning schemes. Community culture needs to be built closer to areas with some level of safety in a 2080 scenario to ensure that the buildings of today are built to withstand, and sink embodied carbon into their sites long term.

We also believe that a building fabric approach from the outset provides community risk mitigation to fire, acute heat and cool risk, droughts with lessening need for localised water, energy and distribution sources.

Flooding risk provides one of the more recently highlighted uninsurable risks to homes and this should be prioritised in planning reforms if there is no mechanism to force banks, real estate and superannuation to coordinate mitigative measures.

We welcome any further feedback and conversation in regard to planning measures which the Institute and members might assist in innovatively designing a pathway away from high climate risk suburbs.