

PlanTech for a Climate Resilient Planning System

The role of data and technology in proactive planning for climate resilient communities

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We would like to acknowledge the Australian Aboriginal and Torres Strait Islander peoples as the traditional custodians of the land across Australia. We also pay our respects to Elders past and present.

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Context

The 'State of the Climate 2020' report by the Australian Bureau of Meteorology (BOM) and CSIRO outlines the substantial impact of a warming climate and rising sea levels to Australia, with increased risk of coastal flooding and erosion, more variable rainfall patterns with increasing droughts, and more frequent and severe natural disasters such as floods and bushfires.

The planning industry will need to play a key role in responding to and preparing for this challenge.

As highlighted in CSIRO's 2020 'Climate and Disaster resilience' report the concept of resilience must be incorporated into planning, land use and decision making processes, with more investment into addressing long term strategic challenges. This need is reinforced in the upcoming Regional Planning process enacted through the Environment Protection and Biodiversity Conservation Act Reforms.

Informed decisions are imperative if we are to build climate resilient settlements, have robust infrastructure, and build back better after natural disasters; digital technologies are a way of building the required information base and empowering planners to apply their expertise and adopt new approaches to these large and interconnected challenges (Digital task force for planning, 2022).

Furthermore, with the passage of the Australian Government's landmark Climate Change Bill in 2022, Australia now has a legislated requirement to reach net zero carbon emissions by 2050. With this, as well as a variety of initiatives aiming to progress past net zero towards a carbon positive future, there is substantial opportunity to utilise the planning system to activate and drive climate positive change across our buildings, infrastructure, settlements and broader environment.

Finally, the Australian Government released the new draft Science and Research Priorities in September 2023, with *Building a stronger, more resilient nation* as one of four national priorities, including *Supporting resilient communities and Build climate resilience in our built environment* as two of the three objectives within this priority.



The role of PlanTech

To quickly achieve effective climate resilience, changes will need to be made to planning systems across Australia. This paper outlines the case for a programme of work focused on the evolution of the planning profession and systems, underpinned by the adoption of digital technology and data tools (PlanTech), to support a climate resilient planning system. The founding partners of this initiative are UNSW, RMIT, FrontierSI and the Planning Institute of Australia, though it is intended that this partnership expands over the course of 2024.

While pursuing digital transformation across the planning systems in Australia is a large and complex endeavour, it presents an opportunity to direct the benefits of this change towards furthering climate resilience. The adoption of digital tools and technology can help both (1) adoption of **proactive** climate adaption measures and (2) more effective **defensive** responses to current and near-future climate related impacts.

Using the lens of both climate mitigation and carbon positive activities, there is clearly a substantial economic case, as well as a significant set of federal government priorities that this initiative will address. At a high level, [Deloitte](#) estimated a \$1.2 trillion dollar cost of natural disasters over the next 40 years.

This is paired with between \$1 billion and \$1.5 billion in estimated economic efficiencies to be gained from a more effective and collaborative planning system, as highlighted in Victoria and NSW, as well as by the federal Productivity Commission.¹

Policy alignment for the PlanTech initiative is broad, from the national cabinet, the national reconstruction fund, Australian Renewable Energy Agency, the Research Priorities of Natural Hazards Research Australia, the Senate Select Committee on Australia's Disaster Resilience, Productivity Commission, the Nature Positive Plan from the Department of Climate Change, Energy, the Environment and Water, and the National Climate Resilience and Adaptation Plan from the Department of Agriculture, Water and the Environment (see [Appendix One](#)).

For the initiative outlined in the remainder of this paper, the term climate resilience is used to both reflect the defensive climate mitigation activities and adaptive carbon positive activities that will enable Australia to prepare for our future changing climate most effectively.



Drivers

State of Play – The cost of natural disasters

In a report commissioned by the [Australian Business Roundtable for Disaster Resilience and Safer Communities](#), it is estimated that natural disasters cost the Australian economy approximately \$38 billion per year. The report, by [Deloitte Access Economics](#), goes on to estimate that under a low emissions scenario natural disasters will cost \$1.2 trillion over the next 40 years. In addition, there is the social impact to consider, with research by the [Climate Council of Australia](#) (2023) finding that approximately 80% of Australians have experienced a disaster in the last five years, with the majority affected living in rural and regional areas. In addition, these households are also more likely to be exposed to other vulnerabilities, with natural hazards set to worsen already vulnerable people's quality of life (Actuaries Institute 2022).

Calls for change

Due to the catastrophic impacts of recent natural disasters, Australia has typically invested more resources into disaster recovery and building back, rather than preparedness and planning. Recognising the increasing cost of more frequent and intense

natural disasters, there is a need to invest resources now to mitigate impacts later, with long-standing and consistent calls for a shift towards disaster preparedness and resilience in Australia, including:



- The Department of Industry, Science and Resources released [Australia's draft National Science and Research Priorities](#), with *Building a stronger, more resilient nation* as one of four national priorities, including *Supporting resilient communities and Build climate resilience in our built environment* as two of the three objectives within this priority.
- The Productivity Commissions inquiry '[Natural Disaster Funding Arrangements](#)' (2014) that recommended the Australian Government provide more funding for pre-disaster mitigation and resilience measures, including improved land use planning – rather than focusing primarily on disaster response and recovery efforts.
- The [Royal Commission into Natural Disaster Arrangements](#) (October 2020) that recommended a major overhaul of Australia's disaster management arrangement framework and greater coordination between federal, state and local government, as well as with community and Indigenous organisations.

- The Intergovernmental Panel on Climate Change (IPCC) ‘Climate change 2021 – the physical science basis’ (August 2021) report that emphasises the need for increased investment in disaster risk reduction and adaptation.
- The McKell Institute ([The Cost of Extreme Weather](#) (2022)) that recommended Federal Government shifts funding to focus on better resilience building and more effective planning and strategy.
- [Deloitte Access Economics](#) (2022) who estimate that by investing in climate change adaptation now, Australia could avoid \$380 billion in worsening economic costs from climate change, with Australia’s adaptation approach required to be reimagined from recovery to resilience.
- The [Insurance Council of Australia](#) (2022) recommended that the Commonwealth invest at least \$200mi/year in extreme weather resilience measures, matched by the states and territories (which was adopted by NEMA in their [Disaster Ready Fund](#)). They also recommended a review of land use planning arrangements, the establishment of a national natural peril data centre to enable better planning by governments and developers, and improvements to data collection and sharing, particularly between the insurance sector and government.

Role of land use planning in disaster mitigation

Adoption of data and technology into core planning policy and development approval processes has the potential to support better disaster preparedness and resilience actions, allow for greater coordination across all levels of government, and provide a consistent and reliable set of data and tools to base decisions and policy from. Providing built environment professionals with better tools and information to inform land use planning policies and decisions can ensure we are building the right things in the right places for our future climate, and can support the implementation of planned retreat from those areas most at risk.

The UK’s Digital Task Force for Planning, draws a clear link between the complex challenges of climate change, biodiversity loss and the push for net zero with the opportunities presented by a digitally enabled, whole systems approach to spatial planning. Recognising that spatial planning is a vital applied science and that support is needed for the digital revolution in spatial planning.

An integrated digitally enabled approach to spatial planning be better manage natural resources, consider multiple land use allocations and enable multi-functionality... integrated digitally enabled spatial planning is a key piece in the jigsaw to achieve a just transition towards net zero carbon.

(Digital task force for planning, 2022, p. 21)

State of Play – Climate positive development

The planning of new development establishes future carbon impacts for generations, and our existing built environment allows only so much room for change. With the global community, including Australia, racing to net zero carbon emissions by 2050, the time is ripe to examine how the planning systems across Australia can be used not just to approve climate friendly developments, but to systematically accelerate the development and adoption of positive solutions.

Many planning jurisdictions are undertaking reviews to determine how to reach net zero earlier than 2050, for example [Victoria’s Inquiry into renewable energy in Victoria](#) (Legislative Council Environment and Planning Committee, 2022) where the first recommendation was to conduct a strategic land use assessment in Victoria’s renewable energy zones to identify suitable sites for generators and transmission infrastructure. Further, it found that the economic impacts of delaying energy transition were extensive, including increasing disasters and substantially increasing health costs. NSW supports this assertion, stating in 2021 that between 0.7 and 2.7 million more days of work will be lost each year due to climate change by 2061 (NSW Treasury, 2021).

While renewable energy and green buildings are both increasing in their adoption and use, the pace of this change is not fast enough, with current planning systems allowing, but not often explicitly encouraging, climate positive developments. While the system is slowly changing to support environmentally sustainable development of buildings, these mostly work within the existing system, rather than examining ways the system itself could help to accelerate adoption.

Calls for change

Many critical local and national organisations have highlighted how planning systems and technology can be used as a force for positive and sustainable change in Australia, including:

- Australia's draft National Science and Research Priorities also includes Ensuring a net zero future and protecting Australia's biodiversity and Priority 1, with all three objectives within the influence of planning and planning technology: *Support our pathway to net zero, Understand and sustain our environment, and Protect and restore biodiversity.*
- The Planning Institute of Australia's key principles (2021) to guide the adaptation and the mitigation of climate change.
- The NSW Government's Net Zero Cities Action Plan (2022), highlighting that up to 70% of global end use carbon emissions are generated by cities.
- The Victorian government outlines a Roadmap for Victoria's planning system (2020) to better support environmentally sustainable development of buildings and subdivisions.
- Green Building Council Australia, the organisation that rates the sustainability of buildings has developed a series of carbon positive roadmaps for the built environment.
- The Planning Institute of Australia's report, Achieving Net Zero Emissions: An Enabling Role of Planning, sets out further opportunities for planning across industry sectors.¹
- Western Australia has recognised the importance of managing climate change impacts during their substantial infrastructure investments, and include many recommendations regarding the role of technology and innovation in achieving their state based net zero 2050 target (July 2022).
- Queensland's Climate Adaptation Strategy includes embedding climate risk in planning and development decisions.

Role of land use planning in climate positive and adaptive development

While developing new sources of energy, new building standards, and minimising development impacts are all activities which can mitigate or reverse the impacts of climate change, ineffective planning instruments may hamper the rapid transition to a carbon positive future. Technology and data can accelerate planning systems deliver on existing and planned carbon positive commitments, including:

- 1. Implementing green and/or decentralised infrastructure:** Land use planning can encourage or mandate green/blue infrastructure, such as green roofs, green walls, rain gardens, rainwater tanks, and permeable pavement, which help to reduce stormwater runoff, mitigate urban heat island effects, and sequester carbon. Planning can also support decentralising key infrastructure to support resilience and local infrastructure access.
- 2. Promoting renewable energy:** Land use planning can facilitate the development of renewable energy infrastructure, such as small and large scale wind and solar farms, which reduce greenhouse gas emissions and promote energy independence.
- 3. Promoting energy-efficient buildings:** Land use planning policy can require or incentivise energy-efficient building practices, such as passive solar design, green roofs, and use of renewable energy sources.
- 4. Preserving and restoring natural areas:** Land use planning can prioritise the preservation and restoration of biodiversity, including restoring natural areas such as forests and wetlands, which sequester carbon and provide ecosystem services.
- 5. Encouraging compact and mixed-use development:** Land use planning policy can encourage compact and mixed-use development patterns that encourage walking, biking, and public transit use can reduce transportation emissions and energy consumption.

¹ Source: <https://www.planning.org.au/documents/item/12553>

Proposed activity streams

As outlined in the PlanTech Barriers and Opportunities Paper (2023), there is a need for strong leadership and governance to drive the digital transformation of the Australian planning sector. There is an opportunity use the growing pressure on the planning sector to plan for a changing climate and increasing natural disasters to demonstrate the benefits of PlanTech and the digital transformation of the planning system, as well as promote existing examples of positive progress across the existing ecosystem.

The aim of this initiative is to provide coordination, investment and strategic direction over the somewhat uncoordinated approach to digital transformation and PlanTech investment across the country. This will ensure research innovation activities are targeted and linked directly to planning system needs and focus on the benefits that can be driven across multiple stakeholder groups.

It is proposed that this Program covers four primary activity streams.



1. Data

Supporting data-driven decision making



Description:

This activity stream focuses on the creation, collection, analysis and application of data to inform decision making and monitoring. It will look at providing robust and consistent analysis ready data for robust and consistent planning decisions, strengthening and speeding up the link between data collection and data application, and harmonising data and standards to support cross-jurisdictional collaboration.

Potential stakeholders:

Federal, state and local governments, communities, insurance companies, planning consultants, technology companies, industry bodies, and universities.

Expected outcome:

A more integrated and standardised approach to data collection and analysis, and support for planners in the use and application of data and analysis. Planners can make more informed decisions about climate resilience, enhanced capacity of planners to engage with stakeholders and the community on climate change and green energy issues, and improved collaboration and data sharing among stakeholders.

Potential impact:

The potential impact of this activity stream is to improve the accuracy and effectiveness of planning and risk decision-making, enabling planners to make more informed decisions about managing climate risk that are less vulnerable to contestation.

2. Skills

Building capacity within the planning profession



Description:

This activity stream focuses on upskilling the planning profession so they can take full advantage of the tools and information available to support a climate resilient built environment. This may involve offering training and development opportunities, promoting collaboration between the worlds of data science and planning, and encouraging the sharing of best practice and innovative ideas.

Potential stakeholders:

Planning professionals, policy makers, industry bodies, consultants, universities, and planning authorities.

Expected outcome:

An upskilled planning profession with planners able to utilise the data and digital to apply their professional expertise to complex challenges. This activity stream hopes to develop planners that are familiar with data science and digital technology tools that are confident and proactive in their application to day-to-day work practices.

Potential impact:

Better and more consistent use and application of digital tools and data in planning processes, and a planning profession that is active in the uptake and adoption of digital tools.

3. Tools

Enabling communication, collaboration and scenario planning



Description:

This stream focuses on the creation of new data products to aid data analysis, decision making, and stakeholder engagement. Tools and platforms can integrate data and legislative requirements and enable high quality and efficient decision making for both strategic and statutory planning, enhancing planners' capacity to address climate resilience and communicate its importance.

Potential stakeholders:

Planning professionals, communities, industry bodies, consultants and platform service providers, universities, and planning authorities.

Expected outcome:

An approachable and integrated suite of data platforms and scenario-based consultation tools that allow planners to make more informed decisions about climate resilience and increase the quality and capacity of planners to engage with stakeholders and the community on climate change and green energy issues.

Potential impact:

Improved resilience of built infrastructure and communities to climate change risks, increased engagement and collaboration among stakeholders in the planning process and improved transparency and accessibility of planning data and information.

4. Governance

Building the right foundations for digital transformation



Description:

This activity stream aims to promote policy reform, standardisation and digitisation of the planning process to determine new growth and development strategies, accelerate the adoption of green energy and buildings standards, while also minimising climate risks. This could involve reviewing existing legislation, streamlining planning processes, and implementing new policies to support climate-friendly development.

Potential stakeholders:

Federal, state and local governments, insurance sector, planning consultants, industry bodies, environmental organisations, and the general public.

Expected outcome:

A more streamlined and efficient planning process that supports the climate positive developments, while also effectively minimising future disaster risk. Harmonised risk assessment between government organisations and the insurance sector, including new governance mechanisms to improve collaboration across sectors managing climate risk.

Potential impact:

Accelerate the adoption of climate positive developments and infrastructure, reducing carbon emissions and minimising the impact of natural disasters. Improved decision making across multiple sectors managing climate risk and increased ability to digitise the planning system. By streamlining the planning process, it could also encourage the uptake of climate-friendly development practices, leading to a more sustainable built environment and supporting a climate-positive future.



A call to action – Developing and investing in a long-term program of change

There are a wide range of novel and innovative ways digital technologies are helping to improve environmental outcomes in the built environment, and plan for a more resilient future. However, there are limited opportunities to pull these initiatives and approaches together, to learn from each other, build upon existing hardware or software, and develop shared approaches to support better local and regional coordination.



This PlanTech partnership is seeking committed partners to support a major initiative to catalyse this change and drive digital transformation for a climate resilient planning system. While the specific funding program target is not yet set, there are a range of innovation, research and training programs which are highly aligned to a programmatic approach to change and uplift to Australia's planning system. Our Program and funding approach will also be shaped by the types of partners we secure to support our bid for change.

The aim of this Program is to provide coordination, investment and strategic direction over the somewhat scattered approach to digital transformation and PlanTech investment across the country, to collectively address shared environmental and resilience challenges. This will ensure research innovation activities are targeted and linked directly to planning system needs and focus on the environmental benefits that can be driven across multiple stakeholder groups.

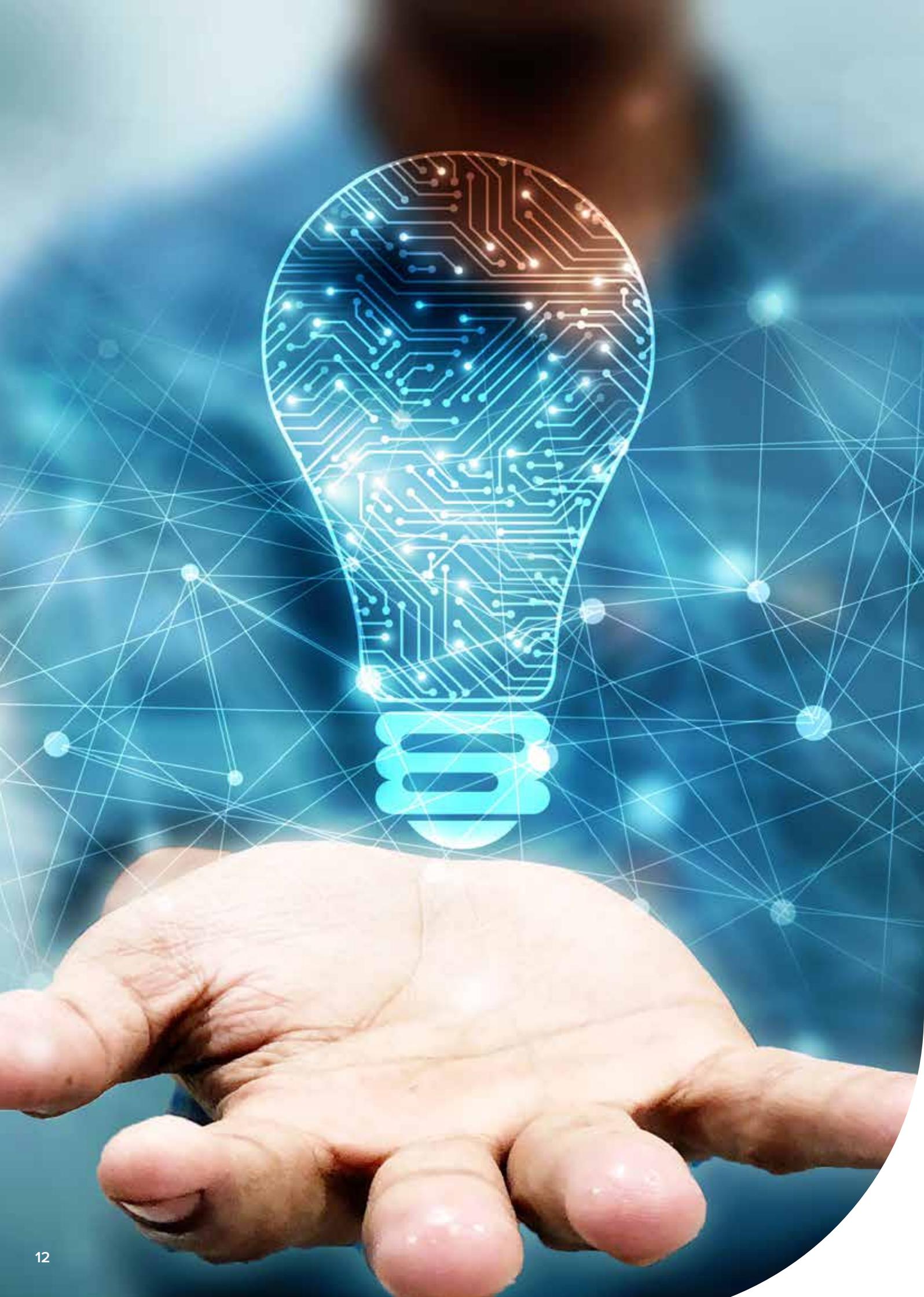
We are seeking expressions of interest from stakeholders who support, and may be willing to co-invest, in initiatives that support digital transformation for a climate resilient planning system. In particular, we are seeking partners in the following areas:

- State Government Departments focused on Planning, Infrastructure and/or Environment
- Local councils
- Federal Government Departments focused on Climate, Infrastructure and Cities and Housing
- Universities with a specific and applied focus on the future of Australia's planning system and technologies
- Technology Companies with a focus on planning data and tools
- Insurance Companies
- Consulting and advisory agencies supporting the planning sector
- Developers and other major participants in the planning cycle

This initiative will represent a clear, coordinated effort to invest in digital technology that can improve information capture, flow and use throughout the planning system and deliver substantial training and capacity building initiatives across the sector.

The call for partners is now open, and will be receiving feedback, letters of support and discussing co-investment from interested partners in the near future.

For more information visit www.plantech.com.au



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Appendix One

Table 1: Existing federal government commitments and priorities

Agency	Commitment
<p>Australian Government <u>2023 Federal Budget</u></p>	<ul style="list-style-type: none"> • Establishment of a Net Zero Authority to help guide the net zero transformation. • \$211mi for a Thriving Suburbs program to provide grants for community infrastructure. • \$159mi for Urban Precinct and Suburbs program to support investment in place-based priorities. • \$11mi to establish the Cities and Suburbs Unit within the Dept. Infrastructure to deliver the National Urban Policy and the regular State of Cities report.
<p>Australian Government <u>Australia’s draft National Science and Research Priorities</u></p>	<p>Australians consistently identified four key priorities that cut across traditional discipline and sector boundaries. These are:</p> <ul style="list-style-type: none"> • Ensuring a net zero future and protecting Australia’s biodiversity • Supporting healthy and thriving communities • Enabling a productive and innovative economy • Building a stronger, more resilient nation. <p>These draft priorities set out the ‘what’ and ‘why’ for Australia’s science and research efforts over the next decade.</p>
<p>National Cabinet</p>	<p>The <u>National Cabinet commitment</u> made a commitment in December 2022 to “develop a national standard for considering disaster and climate risk, as part of land use planning and building reform processes”. State Planning Ministers have been tasked with this reform and are to report back to National Cabinet in 2023.</p>
<p><u>Powering Australia policy</u> – Australian Labor Party</p>	<p>Creating jobs, cutting power bills and reducing emissions by boosting renewable energy are at the centre of Labor’s Powering Australia plan. This plan will bring cheaper renewable energy to Australian homes and businesses.</p>
<p><u>National Reconstruction Fund</u></p>	<p>The NRF will diversify and transform Australia’s industry and economy through targeted investments in the following priority areas:</p> <ul style="list-style-type: none"> • renewables and low emissions technologies • medical science • transport • value-add in the agriculture, forestry and fisheries sectors • value-add in resources • defence capability • enabling capabilities.

Agency	Commitment
<p><u>Research Priorities</u>, Natural Hazards Research Australia (May 2022)</p>	<p>NHRA encourages the use of their research priorities by other organisations to develop or invest in research projects and collaborative initiatives. Relevant research priorities for the PlanTech project include:</p> <ul style="list-style-type: none"> • Community and workforces of the future • Sustainable, safe and healthy natural landscapes – includes a strand on land use planning and better decision making tools • Resilient built environment, includes use of emerging technologies, data access, building codes, land use planning • Resilient communities • Situational awareness, mainly covering data use and access • Operational response and innovation
<p><u>Senate Select Committee on Australia’s Disaster Resilience (2023)</u>, Productivity Commission</p>	<p>Appointed in November 2022 to inquire into Australia’s preparedness, response and recovery workforce models, as well as alternative models to disaster recovery.</p> <p>Final report is due September 2023.</p> <p>Recommended changes across the planning system and, while not explicitly connected to climate resilience, the recommendations to align plans, adopt broad use zoning, make simpler decisions, and efficiency all align to the same problem set in this initiative.</p>
<p><u>Nature Positive Plan</u> – Department of Climate Change, Energy, the Environment and Water (2022)</p>	<p>Broad policy area to ensure biodiversity improvement on the 2020 baseline, including Development Priority Areas, where the planning process has determined development can proceed without a separate Commonwealth environmental approval.</p>
<p><u>National Climate Resilience and Adaptation Plan</u> – Department of Agriculture, Water and the Environment (2021)</p>	<p>The Strategy positions Australia to better anticipate, manage and adapt to climate change. Climate change poses growing challenges to our economic prosperity, the amenity of cities and regions, the health of our environment and ecosystem services, and the wellbeing of our communities.</p>
<p><u>GeoScience Australia</u></p>	<p>Priority projects include Digital Earth Australia which provides satellite imagery to inform Australia, including for monitoring, predicting and preparing for natural hazards and understanding the environment.</p>

