Planning Institute Australia

Achieving net zero emissions

An enabling role for planning

Acknowledgement of Country

The Planning Institute of Australia acknowledges the Traditional Owners of Country throughout Australia and their continuing connection to land, culture, sea and community. We recognise the tens of thousands of years of continuous custodianship and placemaking by First Nations peoples and their proud role in our shared future. This report was produced on the lands of the Gadigal people of the Eora Nation. We pay our respects to Elders past, present and emerging.

About PIA

The Planning Institute of Australia (PIA) is the national body representing planning and the planning profession.

Our mission is to inspire planners and elevate their role in shaping Australia's future. We do this through championing the value of planning, leading the profession, strong advocacy and contemporary education.

This document is part of PIA's ongoing advocacy campaign on planning for climate change. This includes a challenge to all states and territories to implement 10 'asks' for more climate conscious planning systems.

See more of our policy work:

PIA would like to acknowledge the valuable contributions made to this report by Jamie Hogan and PIA's Climate Champions.

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Introduction

This report has been prepared to show where planning needs to enable early action to reduce carbon in every industry sector. The report applies a 'theory of change' approach, asking: if emissions reduction targets are to be met by 2050, what enabling actions would the planning profession have to take and when?

According to the CSIRO, the breakdown of Australia's carbon emissions by sector is approximately as follows:

- Energy (electricity production): 33.6%
- Stationary energy (including the built environment): 20.4%
- Transport 17.6%
- Agriculture 14.6%
- Fugitive emissions 10.0%
- Industrial processes 6.2%
- Waste: 2.7%.

If Australia is to meet its obligations to achieve net zero emissions by 2050, then every industry sector needs to act to successively reduce carbon output according to a series of targets over the next decade. Many of these actions will be assisted by planning and assessment processes.

Where PIA stands

PIA has acknowledged the climate emergency and adopted the World Green Building Council commitment towards net zero carbon before 2050 in line with Australia's support for the UN Paris Agreement. We have a Position Statement and Discussion Paper broadly addressing the role of planning in reducing carbon.

PIA has a campaign to improve planning systems in every State and Territory, challenging every jurisdiction to respond to 10 'asks' for a more climate conscious approach to managing our built environment.

Gap between carbon reduction targets and commitments

In March 2023, the UN Intergovernmental Panel on Climate Change (IPCC) issued their AR6 Synthesis Report, the final of their sixth climate assessment cycle. It states that "modelled pathways consistent with the continuation of policies implemented as of 2020 lead to a global warming of 3.2 degrees by 2100."

This projection is a far cry from the 1.5 degree target of the Paris Climate Accord and would cause devastating international consequences. This is especially true for Australia, which the AR6 Report notes is "one of the most vulnerable developed countries to the impacts of climate change".

The AR6 Report acknowledges that climate policy has accelerated globally since the previous assessment cycle, and that more countries have now committed to net zero. But there remains a clear gap between policy commitments and implementation mechanisms. This reminds us that net zero targets are not a reason to breathe a sigh of relief; they are only the basis for complete policy. In short, we require a quantum leap in policy implementation over the next decade to avoid a climate catastrophe.

Cross-sectoral role for planning

As regulator and facilitator of land use, planning as a profession and policy sphere is naturally related to climate policy. The unique functions of planning intersect with practically all industry sectors, including those addressed in this document which are most critical to emissions reduction.

Planning must assert itself as a key component of coordinated industry policy for decarbonisation. Our profession must rally its people and systems to fulfill this potential as a key enabler in the national policy mix for net zero.

National plans for sectoral decarbonisation

The Minister for Climate Change and Energy Chris Bowen recently announced that the Federal Government will be developing plans for sectoral decarbonisation – including for the Built Environment sector. The announcement followed an agreement from Energy and Climate Ministers to support sector sector-specific policy as part of a national 2050 Net Zero Plan.

The announcement aligns with the approach taken in this report, and reflects PIA's advocacy in both PIA and joint submissions to the CCA on achieving Australia's climate targets.

Structure of this report

This report directly address planning's intersectional role. It outlines the role of planning for decarbonisation in five key sectors:

1.Energy
2.Manufacturing
3.Built Environment
4.Transport
5.Agriculture, Forestry and Land use

The following is provided for each sector:

- A review of existing policy and carbon reduction targets and timing commitments (based on literature review of jurisdictional policy).
- 'Ideal' planning policies for the sector which respond to the targets or commitments to action for carbon reduction (based on literature review of plausible pathways or scenarios for carbon reduction) – expanded in Appendix A.
- A broad-brush overview of current implementation gaps in state/territory policy as of July 2023, using the ratings below:

Commenced / partial | Well-developed

Importantly, this review is limited to the state/territory government level only, and does not consider the work of many local governments which are already progressing the suggested policies.

This report then considers available modelling of plausible carbon reduction pathways and the timing of potential interventions prior to 2030.

We conclude by offering a time sequence for recommended planning policy initiatives requiring action in the immediate (1-2 years), short (3-5 years) and medium term (5-8 years).

Energy Sector

The energy sector deals with electricity generation, which remains Australia's largest source of carbon emissions at approximately 35% of the national total. Decarbonising this sector is arguably the most important pre-requisite for achieving net zero.

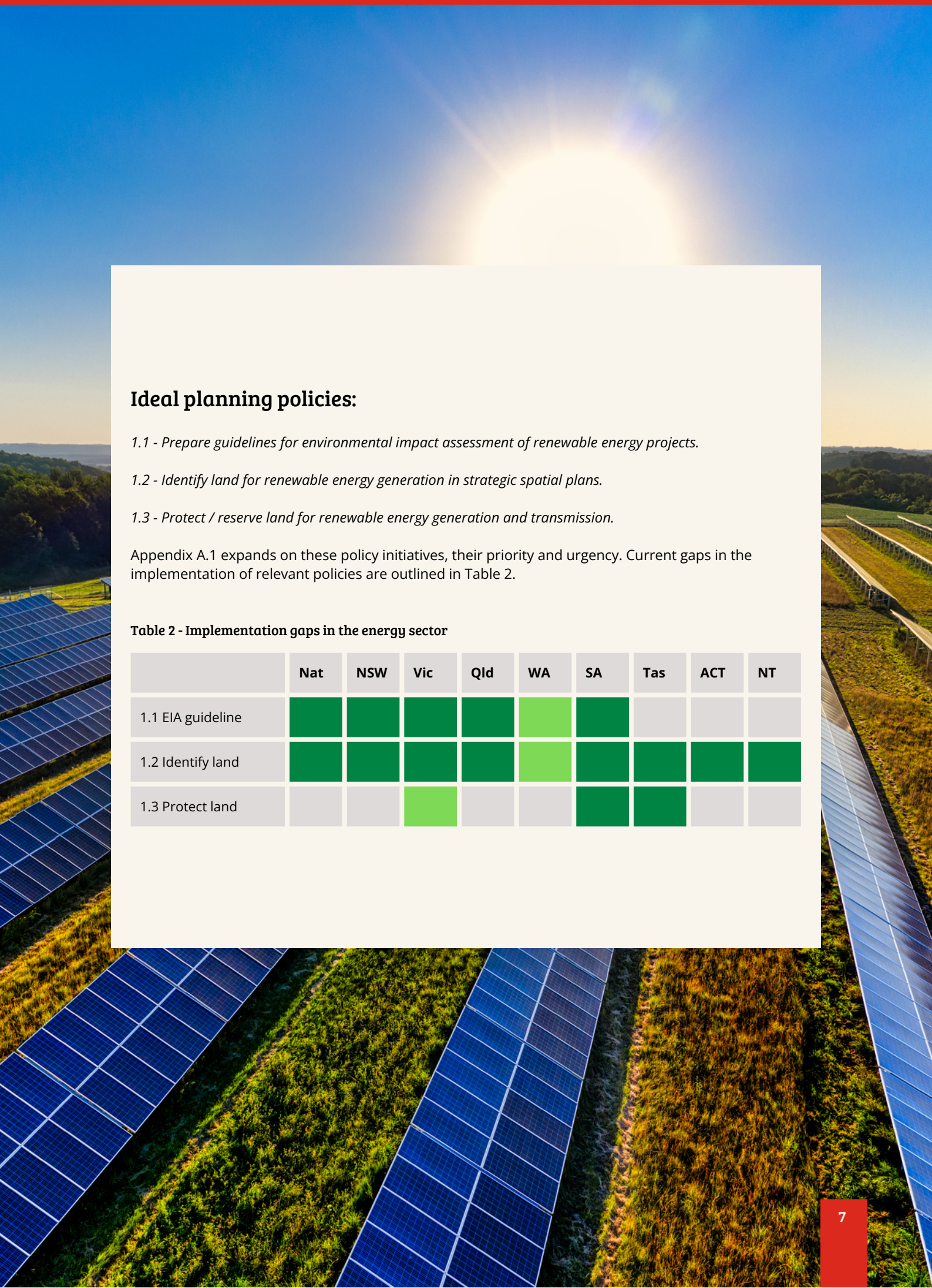
Table 1: Current renewable energy commitments

Jurisdiction	Renewable Target / Estimated Share / Achievement
National	Target of 82% renewable generation by 2030.
NSW	Estimated 68% renewable generation by 2030 based on existing commitments.
Victoria	Target of 65% renewable generation by 2030 and 95% by 2035.
Qld	Target of 70% renewable generation by 2032.
WA	Estimated 56% renewable generation by 2030 based on existing commitments.
SA	Target of 100% renewable generation by 2030.
Tasmania	Target of 200% renewable generation by 2040. Was the first Australian jurisdiction to achieve 100% renewable generation.
ACT	Achieved 100% renewable generation in 2020.
NT	Target of 50% renewable consumption by 2030.

Source: ClimateWorks Centre (2023)

The targets shown in Table 1 are a relatively advanced part of Australia's climate policy; almost sufficient to match the 1.5-degree benchmark for renewable generation (Climateworks 2022).

Their implementation requires planning to act as enabler and coordinator.



Ideal planning policies:

1.1 - Prepare guidelines for environmental impact assessment of renewable energy projects.

1.2 - Identify land for renewable energy generation in strategic spatial plans.

1.3 - Protect / reserve land for renewable energy generation and transmission.

Appendix A.1 expands on these policy initiatives, their priority and urgency. Current gaps in the implementation of relevant policies are outlined in Table 2.

Table 2 - Implementation gaps in the energy sector

	Nat	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
1.1 EIA guideline									
1.2 Identify land									
1.3 Protect land									

Manufacturing Sector

Manufacturing is an energy intensive process requiring an array of inputs which themselves must be extracted and processed. This compounding process cannot continue to rely on resource exploitation if net zero is be achieved, and must instead embrace circular economy (CE) principles.

Table 3: Current CE policies by government jurisdiction

Jurisdiction	CE policy
National	National Waste Policy; Circular Economy Ministerial Advisory Group
NSW	Circular Economy Policy
Victoria	Recycling Victoria: A new economy
Qld	Waste Management and Resource Recovery Strategy
WA	Waste Avoidance and Resource Recovery Strategy 2030
SA	Supporting the Circular Economy – SA Waste Strategy 2020-2025
Tasmania	Draft Tasmanian Waste and Resource Recovery Strategy 2022-2025
ACT	Draft ACT Circular Economy Strategy 2022-2025
NT	Circular Economy Strategy 2022-2027

Source: PIA (2023)

The implementation of CE strategies has place-based implications. Changing industrial practices require new supporting infrastructure which planning must coordinate. Planning systems can also induce demand for sustainably manufactured building components.

Ideal planning policies:

2.1 - Include objectives in planning legislation to consider the life cycle of building design.

2.2 - Prepare a national/state/territory strategy for infrastructure to support CE.

Appendix A.2 expands on these policy initiatives, their priority and urgency. Current gaps in the implementation of relevant policies are outlined in Table 4.

Table 4 - Implementation gaps in the manufacturing sector

	Nat	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
2.1 Statutory objective									
2.2 CE Strategy									

Built Environment Sector

Australia's built environment is responsible for approximately one fifth of our emissions and over 50% of our electricity use. Our building stock is also expected to double between 2019 and 2050, making this sector crucial to achieve net zero.

Carbon emissions occur across the stages of a building's life cycle. Embodied carbon refers to the emissions arising from the production of building materials, construction and maintenance. Operational carbon refers to the emissions from energy consumed during a building's use.

Table 5: Current policies related to embodied and operational carbon by government jurisdiction

Jurisdiction	Operational	Embodied
National	NCC; YourHome; NatHERS and NABERS; Commercial Building Disclosure Program	Adaptive Reuse: Preserving our Past, Building our Future
NSW	BASIX; Apartment Design Guide	Sustainable Building SEPP; Accelerating Net Zero Buildings program
Victoria	Victorian Planning Provisions, Better Apartment Design Standards	-
Qld	Building in Queensland's Climate Zones; Designing for Queensland's Climate	-
WA	-	-
SA	-	-
Tasmania	-	-
ACT	Efficiency standards in Residential Tenancies Act 1997	-
NT	-	-

Source: PIA (2023)

The awareness of carbon emissions in the built environment varies widely between governments, particularly regarding embodied emissions. Policies are needed to accurately account for both embodied and operational carbon and set standards for development at different scales. The regulatory functions of planning systems are clearly intertwined with this task.

Ideal planning policies:

Operational emissions:

3.1 Prepare / upgrade mandatory standards for building efficiency.

3.2 Prohibit new gas connections.

3.3 Prepare / upgrade sustainable design standards for new developments and infill and greenfield precincts.

Embodied emissions:

3.4 Adopt a methodology for accounting for embodied carbon and require disclosure in development applications.

3.5 Set standards for embodied carbon in new development.

Appendix A.3 expands on these policy initiatives, their priority and urgency. Current gaps in the implementation of relevant policies are outlined in Table 6 and Table 7.

Table 6 - Implementation gaps in the built environment sector (operational emissions)

	Nat	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
3.1 Building standards									
3.2 Prohibit new gas									
3.3 Design standards									

Table 7 - Implementation gaps in the built environment sector (embodied emissions)

	Nat	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
3.4 Require disclosure									
3.5 Set standards									

Transport Sector

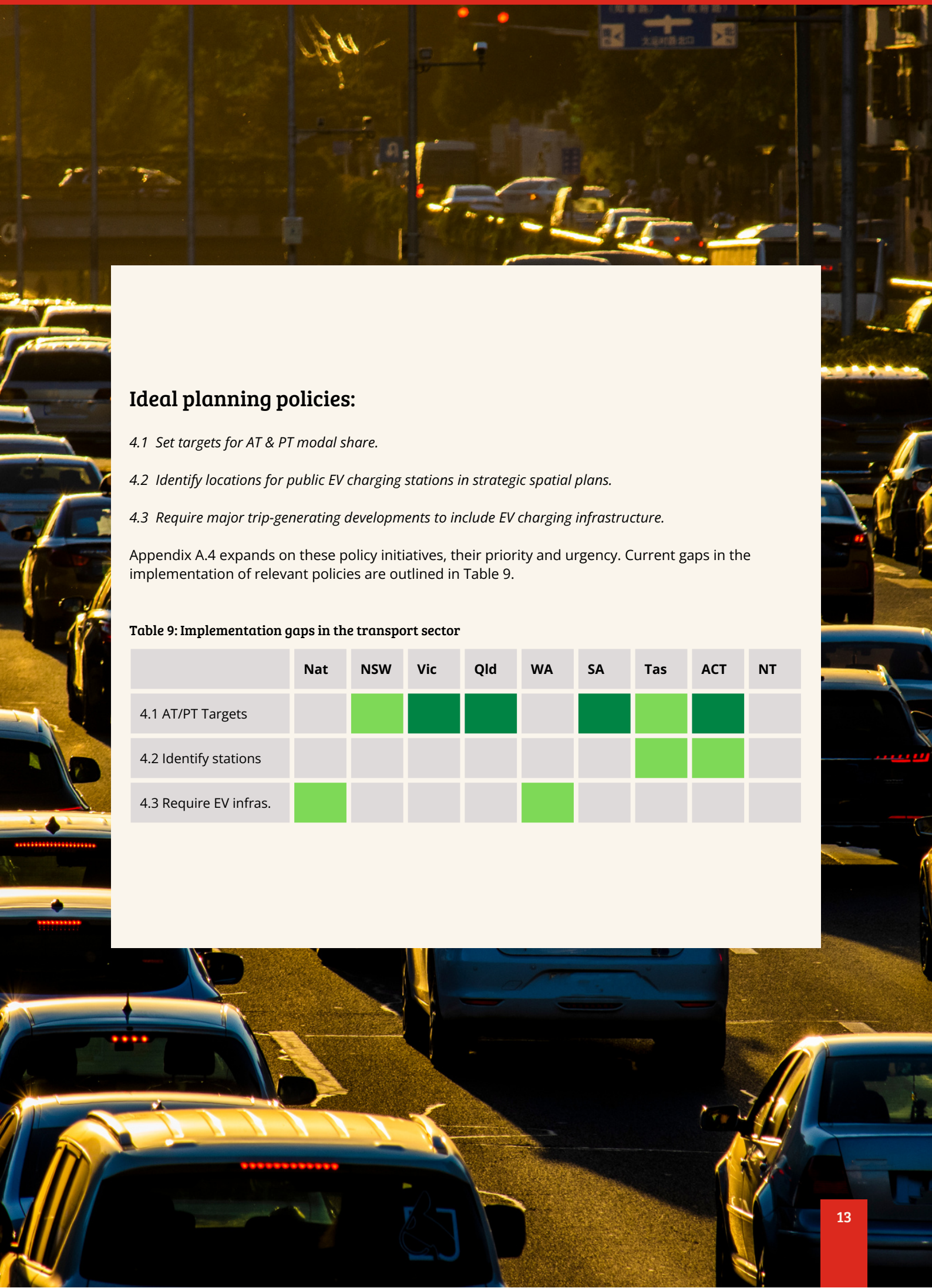
Transport is the cause of one fifth of Australia's emissions and is also fundamentally linked to our patterns of urban development. As a result, the benefits of carbon mitigation in this sector are bound to the other social and economic benefits of active transport (AT) and public transport (PT) use. Faster adoption of electric vehicles (EV) is also important.

Table 8: Current targets for modal shift by government jurisdiction

Jurisdiction	Targets for AT / PT / EVs
National	National Electric Vehicle Strategy defers to state/territory targets.
NSW	52% of new car sales to be EVs by 2030-31.
Victoria	50% of light vehicle sales to be zero-emissions vehicles (ZEVs) by 2030.
Qld	25% increase in the share of AT by 2025; 50% of new passenger vehicle sales to be ZEVs by 2030 and 100% by 2036.
WA	-
SA	30% of work trips in Adelaide to be via AT in 2045; EVs to be 'default' choice of motorists by 2035.
Tasmania	-
ACT	14% of trips to be via AT by 2025; 16% of trips to be via PT by 2025; 80-90% of new light vehicle sales to be ZEVs by 2030.
NT	-

Source: Australian Government (2023)

There is an inextricable relationship between land use, urban density and transport needs. Public and active transport should be coordinated with urban development to achieve climate change mitigation and other planning aims simultaneously.



Ideal planning policies:

4.1 Set targets for AT & PT modal share.

4.2 Identify locations for public EV charging stations in strategic spatial plans.

4.3 Require major trip-generating developments to include EV charging infrastructure.

Appendix A.4 expands on these policy initiatives, their priority and urgency. Current gaps in the implementation of relevant policies are outlined in Table 9.

Table 9: Implementation gaps in the transport sector

	Nat	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
4.1 AT/PT Targets									
4.2 Identify stations									
4.3 Require EV infras.									

Agriculture, Forestry and Land Use Sector

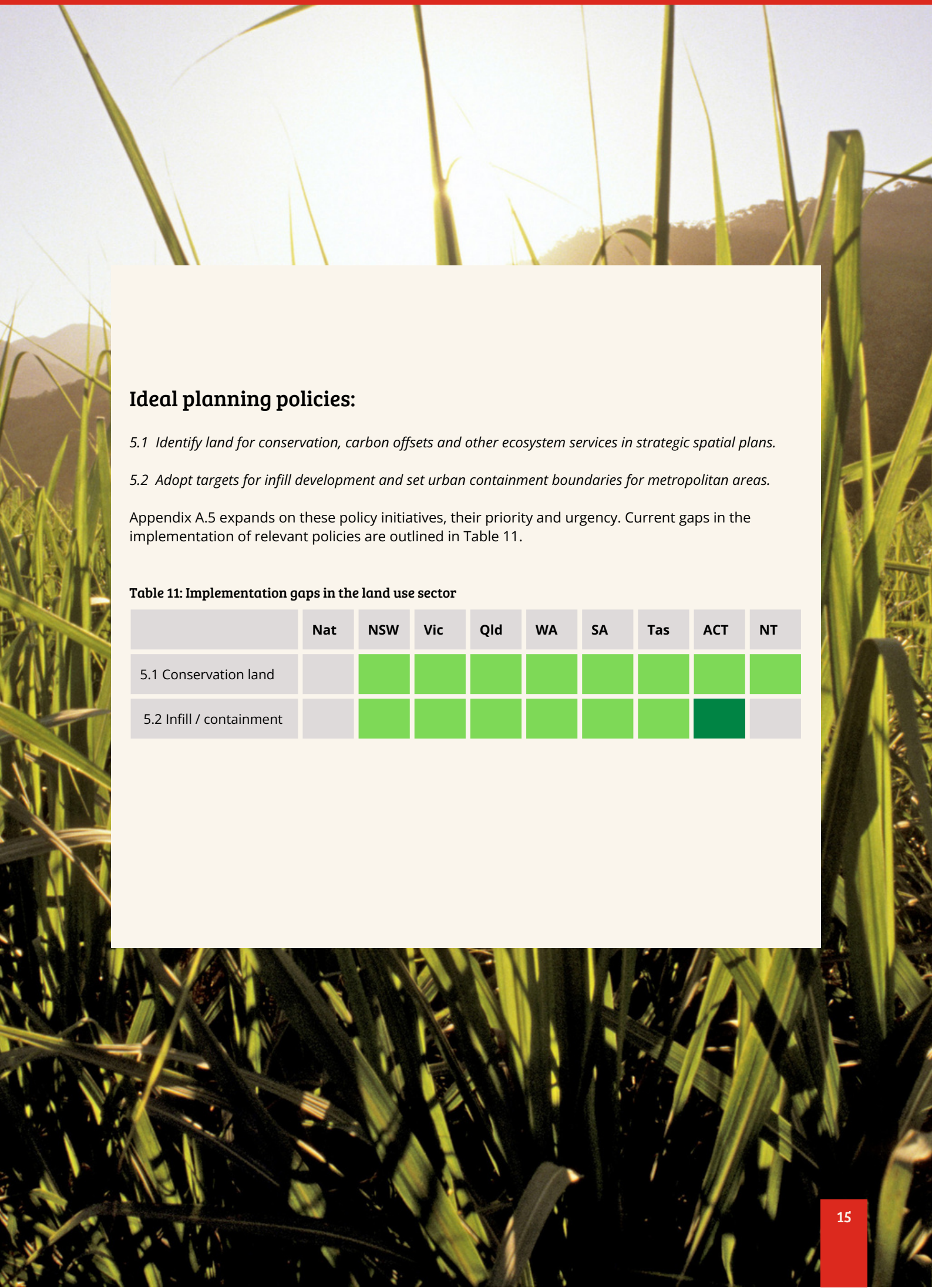
Consumption of land for agriculture, resource extraction and urban expansion are major contributors to worsening environmental quality and net emissions. On the other hand, designation of land for sustainable forestry or conservation are important tools for carbon sequestration to offset emissions. Committed land use policy is required to manage these tensions amid climate change.

Table 10: Current regional land use strategies by government jurisdiction

Jurisdiction	Regional land use strategy
National	Recovery plans for threatened species or threatened ecological communities
NSW	Regional Plans
Victoria	Regional Growth Plans
Qld	Regional Plans
WA	Regional and sub-regional strategies
SA	South Australia Carbon Sequestration Strategy; Regional Plans
Tasmania	Regional Land-Use Strategies
ACT	ACT Climate Change Strategy 2019-2025
NT	NT Compact Urban Growth Policy; Strategic Land Use Plans

Source: PIA (2023)

Protection of land for open space, recreational, scenic, agricultural and ecological purposes is a longstanding planning function. Emissions reduction now provides a further basis to expand and strengthen this role.



Ideal planning policies:

5.1 Identify land for conservation, carbon offsets and other ecosystem services in strategic spatial plans.

5.2 Adopt targets for infill development and set urban containment boundaries for metropolitan areas.

Appendix A.5 expands on these policy initiatives, their priority and urgency. Current gaps in the implementation of relevant policies are outlined in Table 11.

Table 11: Implementation gaps in the land use sector

	Nat	NSW	Vic	Qld	WA	SA	Tas	ACT	NT
5.1 Conservation land									
5.2 Infill / containment									

The pace of change

The decade between 2020 and 2030 is recognised as a critical window of opportunity for climate policy to fulfill the Paris targets. Substantial policy acceleration must occur throughout this window for us to reach net zero by 2050.

The decade between 2020 and 2030 is recognised as a critical window of opportunity for climate policy to fulfill the Paris targets. Substantial policy acceleration must occur throughout this window for us to reach net zero by 2050.

2030 is set as an outer limit for implementation of the suggested planning policies. This matches the benchmark scenarios for technology uptake and emissions reduction developed by Climateworks Centre (2020).

Starting from an idealised scenario of complete implementation of recommended policies by 2030, actions have been sequenced to create an order of priority, in accordance with change management principles. Benchmark scenarios prepared by Climateworks Centre and Low Carbon Living CRC (see Appendix B) have assisted this process.

This has resulted in planning policies being categorised into three time horizons: Immediate (1-2 years), Short (3-5 years) and Medium (6-8 years). Multi-year horizons are used in recognition of the inevitable variation between different jurisdictions.

Immediate (1-2 years)		Short (3-5 years)			Medium (6-8 years)		
2023	2024	2025	2026	2027	2028	2029	2030

The resulting pathways for planning policy are shown on the following page.

Table 12: Pathways for planning policy by 2030

Sector	Planning Policy	Time Horizon
Energy	1.1 Prepare guidelines for environmental impact assessment of renewable energy projects.	Immediate
	1.2 Identify land for renewable energy generation in strategic spatial plans.	Immediate
	1.3 Protect / reserve land for renewable energy generation and transmission.	Medium
Manufacturing	2.1 Include objectives in planning legislation to consider the life cycle of building design.	Immediate
	2.2 Prepare a national/state/territory strategy for infrastructure to support CE.	Short
Built environment	3.1 Prepare / upgrade mandatory standards for building efficiency.	Immediate
	3.2 Prohibit new gas connections.	Immediate
	3.3 Prepare / upgrade sustainable design standards for new developments and infill and greenfield precincts.	Short
	3.4 Adopt a methodology to account for embodied carbon and require disclosure in development applications.	Immediate
	3.5 Set standards for embodied carbon in new development.	Short
Transport	4.1 Set targets for AT & PT modal share.	Immediate
	4.2 Identify locations for public EV charging stations in strategic spatial plans.	Short
	4.3 Require new developments to include EV charging infrastructure.	Short
Land use	5.1 Identify land for conservation, carbon offsets and other ecosystem services in strategic spatial plans.	Short
	5.2 Adopt targets for infill development and set urban containment boundaries for metropolitan areas.	Short

Appendix A: Expanded Ideal Planning Policies

A.1 Energy Sector

1.1 Prepare guidelines for environmental impact assessment of renewable energy projects (immediate).

- Large renewable energy projects often encounter complex issues such as conflict with rural land uses, amenity impacts and biodiversity loss.
- Guidelines for environmental impact assessment give certainty to proponents and assessors about how these issues are dealt with.
- This streamlines delivery and creates a stable environment for investment in renewables.

1.2 Identify land for renewable energy generation in strategic spatial plans (immediate).

- Renewable energy generation has requirements for location, space and supporting infrastructure such as worker's accommodation.
- Strategic spatial plans should be used to coordinate infrastructure, private investment and streamlined regulations for renewable energy projects.
- This requires an integrated stakeholder approach to minimise conflict at subsequent stages of implementation (see 1.3 below).

1.3 Protect / reserve land for renewable energy generation and transmission (medium).

- Once signalled in strategic spatial plans, land should be purchased or protected for renewable energy generation and transmission.
- This ensures return on infrastructure investment and secures a long-term supply of land for renewable energy generation to power the entire grid.

A.2 Manufacturing Sector

2.1 Include objectives in planning legislation to consider the life cycle of building design (immediate).

- This provides a legislative basis for regulatory standards to require green building technologies and construction techniques.

2.2 Prepare a national/state/territory strategy for infrastructure to support CE (short).

- Implementation of CE principles has requirements for location, space and supporting infrastructure such as waste processing facilities.
- This should include co-location of mutually beneficial CE uses e.g. waste disposal, recovery and processing facilities.
- Research should guide infrastructure strategy to implement CE principles, such as that by the Infrastructure Sustainability Council et al (2020).

A.3 Built Environment Sector

3.1 Prepare / upgrade mandatory standards for building efficiency (immediate).

- The National Construction Code should be updated to raise baseline standards.
- States and territories may also have their own standards which can be raised, such as BASIX in NSW.
- Compliance with new standards should be assessed using updated climate data.
- New tools should also be developed to inform efficiency standards based on location.

3.2 Prohibit new gas connections (immediate).

- Development standards should be amended to prohibit gas connections in new homes.
- This allows a greater proportion of households to meet their energy demands entirely with renewables.

3.3 Prepare / upgrade sustainable design standards for new developments and infill and greenfield precincts (short).

- These standards should provide a minimum baseline for sustainable design in new development.
- At the building level, standards should include solar access and cross-ventilation to reduce heating and cooling loads.
- At the precinct level, standards should include landscaping and active transport infrastructure.
- Sustainable design standards should also involve reduced car parking rates according to transit accessibility.

3.4 Adopt a methodology to account for embodied carbon and require disclosure in development applications (immediate).

- The first step to reduce embodied carbon is to adopt consistent accounting and reporting methods.
- This provides a signal and transition period before new standards are introduced.
- Suitable accounting methods have been developed by Low Carbon Living CRC (2021).

3.5 Set standards for embodied carbon in new development (short).

- Standards should then be implemented using the same accounting and reporting methods.
- These should be progressively updated over time as the sector adjusts.

A.4 Transport Sector

4.1 Set targets for Active Transport and Public Transport modal share (immediate).

- Targets for modal share provide a basis for infrastructure investment to join-up active and public transport networks.
- This type of coordinated investment is needed to mainstream alternatives to car transport.
- Targets for model share are also a basis for more effective coordination between public and active transport and urban development.
- They are also linked to A3.3 (see above), as they provide a basis for building and precinct design standards to reduce car dependency.

4.2 Identify locations for public EV charging stations in strategic spatial plans (short).

- This should involve documenting existing EV charging facilities and prioritising investment in new facilities where deficits are identified.

4.3 Require new developments to include EV charging infrastructure (short).

- Development standards for multi-unit housing and offices should eventually be amended to require EV charging facilities.
- Consistent guidelines should also be provided for designing these facilities.

A.5 Agriculture, Forestry and Land Use Sector

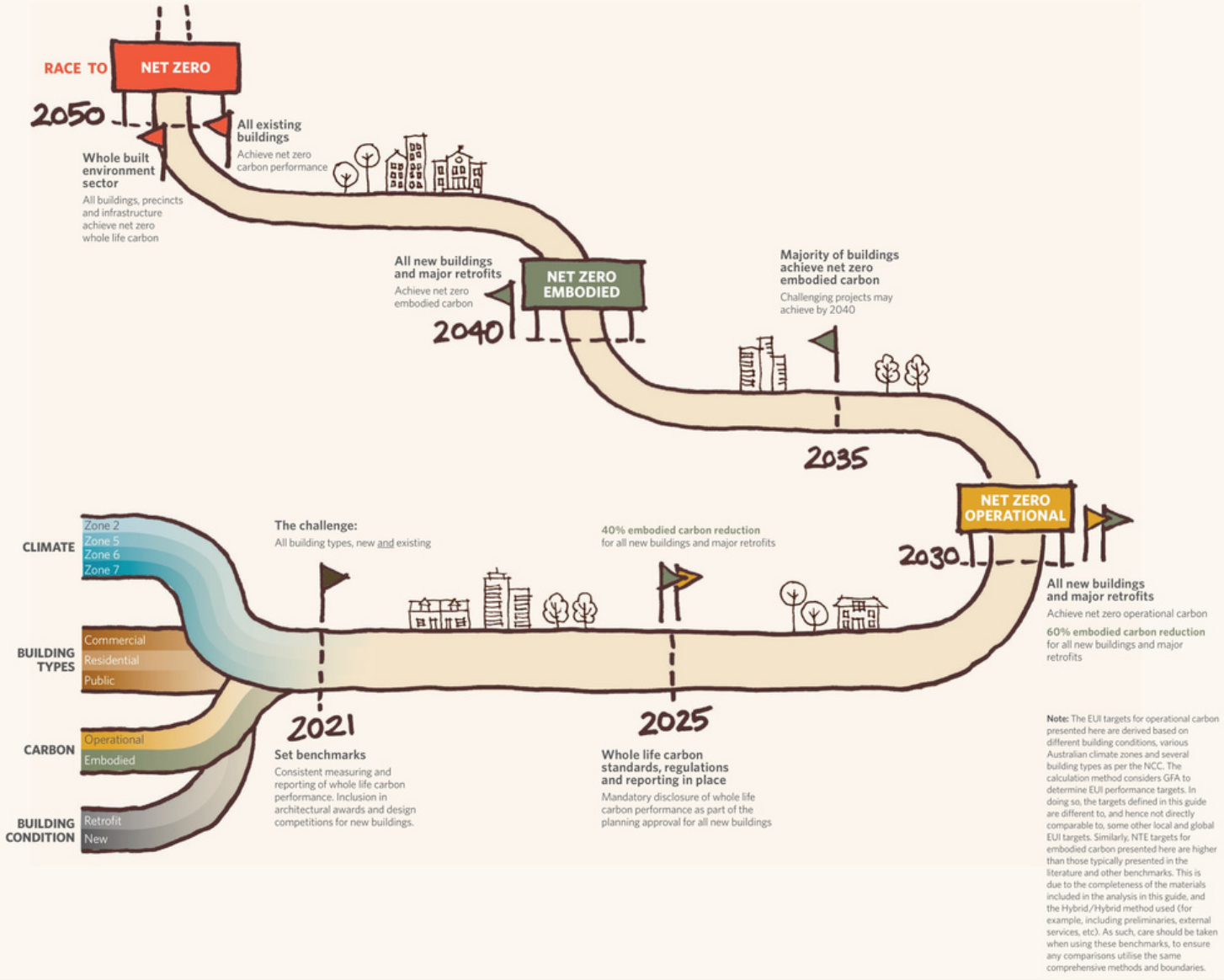
5.1 Identify land for conservation, carbon offsets and other ecosystem services in strategic spatial plans (short).

- Strategic spatial plans should recognise the importance of land for conservation and ecosystem services such as carbon sequestration.
- Land should be explicitly identified for the purposes accordingly.

5.2 Adopt targets for infill development and set urban containment boundaries for metropolitan areas (short).

- Targets for infill development and urban containment boundaries should provide a basis for planning policies to achieve compact settlement patterns.
- This prevents vegetated areas from being constantly consumed for urban development.
- Urban containment is also needed to preserve land for local food production with reduced food miles.

Appendix B: Net Zero whole life carbon pathway



Source: Low Carbon Living CRC (2021)

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