



Australian Institute of
Landscape Architects

Climate Positive Design

Position Statement

Introduction

“Climate change is the defining issue of our time”

Sir David Attenborough 2018.¹

An historic global climate agreement was agreed by Australia under the United Nations Framework Convention on Climate Change (UNFCCC) at the 21st Conference of the Parties (COP21) in Paris (30 November to 12 December 2015).

The 2015 Paris agreement commits Australia to zero net emissions by 2050².

It is estimated that cities account for 60-70% of greenhouse gas (GHG) emissions³ and concrete for 5-7% GHG emissions⁴.

This means that every park, streetscape, urban plaza and playground landscape architects plan and design needs to be carbon neutral by 2050.

This includes the planning and design stage, construction stage, the life of the project and its eventual demolition.

As many of the projects underway will most likely be here in 2050, climate positive design approaches need to be embedded into all current and planned projects.

Therefore, the Australian Institute of Landscape Architects (AILA) advocates *Climate Positive Design* to sequester more GHG than is emitted by a project over its entire lifetime.

Meeting Australia's commitments under the 2015 Paris agreement requires a significant rethink on how landscape architects approach projects.

To embrace Climate Positive Design, there are three key things Landscape Architects can do:

1. Understand the environmental and carbon impacts of what we do through evidence-based research.
2. Manage and mitigate these impacts through good planning and design.
3. Advocate and educate for better understanding of carbon neutral and climate positive design with our clients, colleagues, collaborators, stakeholders and Government.

As stewards of the environment, landscape architects must advocate for the achievement of climate positive outcomes, extending the current approach of carbon neutral outcomes.

Climate positive design draws upon good design practices associated with climate adaptation and mitigation techniques covered in several [AILA position statements](#), including *Green Infrastructure*, *Cooling Cities*, and *Climate Change* position statements.

Why is Climate Positive Design important? **Key Objectives**

With no action on climate change, there will be a three to five degree warming of the planet from anthropogenic greenhouse gases by 2100.

As of November 2019, the current 410ppm concentration of atmospheric CO₂ is now higher than any time in the last four million years⁵. It is well above the earth's 800,000 year stable natural carbon budget of 180-280ppm.

The United Nations Intergovernmental Panel on Climate Change (IPCC) recently identified potentially catastrophic social, environmental and economic consequences as a result of this warming².

In the last year, there have been a series of devastating international reports highlighting the urgent need for action. These include:

- The October 2018 United Nations Intergovernmental Panel on Climate Change (IPCC) issued a stark warning, that we only have 11 years to halve our anthropogenic greenhouse gas emissions and be net carbon neutral by 2050.²
- The May 2019 United Nations IPBES report identified unprecedented species extinction rates, highlighting that nearly one million species are at risk of becoming extinct, many within decades.⁶
- The September 2019 IPCC "Special Report on the Ocean and Cryosphere in a Changing Climate" indicated accelerated sea level rise.⁷

Of concern to AILA is that the world's scientists don't know when the earth's natural feedback loops will accelerate these problems to a point where humans can no longer control it.

This is what is often referred to as a tipping point. Currently, we can only reduce anthropogenic greenhouse gases, and urgent action is needed to minimise the risk of reaching an uncontrollable tipping point created by the earth's own natural systems and cycles.

Reducing the GHG emissions of projects to zero or neutral, simply balances out emissions. Moving to Climate Positive Design we draw existing CO₂ out of the atmosphere, making long-term benefits.

In response in August 2019, AILA declared a climate and biodiversity emergency⁸, and in September 2019, the 77 member countries of the International Federation of Landscape Architects (IFLA) also unanimously declared a climate and biodiversity emergency.⁹

Climate Positive Design will allow projects to sequester more GHG than they produce in their design, construction, management and eventual demolition.

This will enable all projects to avoid increased emissions and longer time for CO₂ sequestration.

The following objectives outline the approach in detail.

1. Understand the environmental and carbon impacts of what we do through evidence-based research

To achieve a Climate Positive Design, we need to understand the carbon equivalents incorporated in all stages of the project design cycle from cradle to grave.

This requires us to consider direct emissions and indirect CO₂ emissions, balanced out with emissions avoidance and sequestration from soil, plants and trees.

Broadly, the following stages can be used as a guide:

- **Planning stage:** Strategic planning assessment, needs and options assessments, long-term planning for 2050 (including adaptive strategies), vehicle and aircraft trip emissions to site, and office energy consumption.
- **Design stage:** Considered planning and design at all levels, setting performance targets, materials selection (including consideration of key materials such as concrete and steel), vehicle and aircraft trip emissions to site, and office energy consumption.
- **Construction stage:** Emissions from the manufacture, transport and installation of the project (particularly concrete, steel and waste), including emissions (such as vehicle transport by construction workers to and from site).
- **Operational and maintenance stage:** Includes emissions from operations and maintenance. This is balanced out by the sequestration drawdown of CO₂ by vegetation and soil. At a detailed level, it could account for saved emissions through active travel and a cooler built environment.
- **Demolition/dismantle stage:** This includes all GHG generation from the demolition, recycling, and potential waste emissions such as methane from landfill.

Current resources available to assess the impacts of what we do is the [Carbon Positive Pathfinder](#) toolkit and the Landscape Architecture Foundation research material provided in the case studies and appendices.

2. Manage and mitigate these impacts through good planning and design

Once the impacts and stages of projects are understood, management and mitigation is required through good planning and design.

This is achieved by:

- Identifying and using materials that have lower embodied CO₂, and looking at ways to maximise carbon sequestration. To maximise sequestration, tree planting should ensure adequate soil volumes with appropriate physical and chemical soils composition, mycorrhiza and organic nutrients, and passive irrigation. Healthy tree growth has multiple benefits including sequestered CO₂ and reduced heat island effects. Refer to the [AILA Urban Cooling Position Statement](#)
- The use of verifiable carbon offsets through existing accredited third party Green Offsets Programs [link here](#)
- Including using green infrastructure in place of traditional concrete-intensive grey infrastructure. This has long-term flow on benefits, including avoidance costs, and minimisation of maintenance and replacement costs as well as ecosystem benefits (refer to AILA's the [Green Infrastructure Position Statement](#))
- Strategies that result in more compact, higher-density cities, region and settlements that prioritise sustainable transport to reduce Australia's carbon footprint. The Centre for Co-operative research for low carbon living identifies guidelines for the planning of low carbon precincts [link here](#)
- Providing walkable barrier-free environments that encourage active mobility and transport. These not only provide health and social benefits but also reduce emissions from fewer vehicle trips [link here](#)
- Planning to integrate the ongoing development of new technologies. Planning for electric and autonomous vehicles, for example, will provide considerable opportunities [link here](#)

It is envisaged that the progressive development of toolkits and other resources will be undertaken over the next few years to help us meet the IPCC 50% reduction target by 2030.

This will likely be a collaborative effort not just Australia-wide, but including our international landscape architectural colleagues and allied organisations.

3. Educate and advocate for climate positive design with our clients, colleagues and government

Landscape architects are often in a position to provide and develop a 'big picture' view of a project and have the skills and expertise to help communicate that to the client, stakeholders and design team.

As stewards of the environment, we have a responsibility to ensure that, as much as possible, we help our clients, colleagues and government understand the benefits of climate positive design.

Clients and Allied Professionals

Many of our clients, consultants and collaborators may not be familiar with Climate Positive Design.

Landscape architects have responsibility to reinforce the economic, social, environmental and cultural benefits of incorporating Climate Positive Design, providing advice to clients on offset programmes where appropriate or seeking professional guidance.

Government

Governments at all scales in Australia (Australian, State/Territory and Local) have many climate policies that are relevant to Climate Positive Design.

Landscape architects can assist mapping the relevance and connections between various policies and strategies to enact change.

Our role is to effectively communicate the benefits and imperatives of Climate Positive Design with all levels of government on our projects.

Climate Positive Design fosters positive language, including the following terms:

- Adaptation and mitigation
- Urban cooling
- Green infrastructure
- Climate Positive Design

AILA will develop a future toolkit to support engagement strategies and advocacy by and for landscape architects.

AILA's position on Climate Positive Design

AILA commits to the objectives of Climate Positive Design and will support all AILA members in adapting their approach to achieve the objectives of Climate Positive Design.

AILA commits to the following actions:

Advocate to Government

AILA will:

- Advocate to all levels government (Australian, State/ Territory and Local) for the development of Climate Positive Design strategies and standards
- Continue to support current carbon neutral strategies.

Support AILA members

AILA will support AILA members to:

- Foster evidence-based research to support accurate carbon footprint assessments
- Promote development of climate positive tools and resources to support members
- Progressively develop educational resources and continuing professional development outcomes for members
- Support member practices becoming climate positive.

Work cooperatively with others

AILA will:

- Work with our local and international landscape architectural and professional partners including the AIA, ASBEC, IFLA, ASLA, CSLA, NZILA, PIA, Engineers Australia, the Landscape Institute, the Landscape Contractors Association and others, towards common goals
- Work to develop climate positive strategies for the agricultural/land sector, and in particular soil health, with input from land managers including Aboriginal leadership and involvement, forestry departments and farmers
- Champion high-quality carbon positive design research in Australia, supporting and collaborating with research organisations including but not limited to the CSIRO, the Centre for Co-operative Research for low carbon living, Climate Works Australia, the Climate Council, Beyond Zero Living, the University of Western Sydney Eucface and TERN

- Partner with appropriate agencies to provide certified biodiverse carbon sequestration services to members and their clients
- Advocate with industry to develop carbon neutral materials including concrete, steel and aluminum.

Support measures that rapidly reduce Australia's green house gas emissions

AILA commits to promoting measures that rapidly reduce Australia's GHG emissions to net zero by 2050 including supporting the following initiatives:

- Large-scale biodiverse carbon planting and offset opportunities throughout Australia, that restore degraded lands and habitat¹⁰
- Sustainable timber production for the construction industry, where ecological values are managed¹¹
- Regenerative farming practices that increase soil carbon and increase habitat without loss of food production or reliance on imported fertiliser and pesticides¹²
- Strategies to increase biodiversity and reduce extinction loss
- The managed phasing out of fossil fuel extraction industries and their associated land, water and climate impacts by 2050. Support measures towards a just transition for workers including an independent federal authority and communities effected by such change¹³
- Measures that retain, protect, and restore natural ecosystems to maximise their biodiversity, environmental, and social values¹⁴
- Measures that greatly reduce or halt land clearing, or provide 5 times the biodiverse offsets where it cannot be avoided
- Protecting old growth forests, their ecologies and carbon stores
- support uniform nature protection laws throughout Australia¹⁵
- Work with indigenous communities to protect and manage our land, including cultural burning practices¹⁶
- Protecting of our rivers and groundwater supplies
- Promoting best practice landscape architecture to help integrate facilities, buildings, products, and services into the landscape that de-carbonise our economy¹⁷
- Work with government and developers on low carbon communities, and net zero energy precincts. ¹⁸

Case Studies

Carbon Positive Design pathfinder online toolkit

This is a free online application developed in the United States by San Francisco-based Landscape Architect Pamela Conrad.

The Carbon Positive Design Pathfinder calculates the overall carbon footprint of a project including carbon sources and carbon sinks. This is an excellent starting point for Australian landscape architects to see how green their projects are. Given the IPCC target for carbon neutrality is 2050, suggested carbon positive targets are:

- 5 years to positive for parks, residential, on-structure, mixed-use or campus developments
- 20 years to positive for streetscapes or plazas

Climate Positive design website

<https://climatepositivedesign.com/>

Pathfinder online tool

<https://climatepositivedesign.com/pathfinder/>

LAF – Landscape Architecture Foundation

The Landscape Architecture Foundation (LAF) aims to support the preservation, improvement and enhancement of the environment. They are privately funded and have a very good resource kit. It is an excellent starting point for landscape architects. Their key actions are to:

- Inform and understand the problem
- Seek out precedents
- Set bold design goals
- Advocate

<https://www.lafoundation.org/resources/2018/10/climate-change-resource-guide>

The Carbon Landscape

NZILA fellow Craig Pocock's research covers issues such as the potential carbon cost of urban and landscape design, implementation, management and the disproportionately high carbon cost of urban renewal of public spaces.

<https://nzila.co.nz/news/2018/07/the-carbon-landscape-roadshow>

Carbon roadshow. One hour video of the NZILA carbon roadshow.

<http://www.carbonlandscape.com/carbon-road-show.html><http://www.carbonlandscape.com/short-films.html>

IFLA presentation: https://www.youtube.com/watch?time_continue=135&v=oXShvTzo00

Environmental Performance Indicator tool (EPI tool) - SPROUT landscape architects

Sprout Landscape Architects in Sydney have developed an Environmental Performance Indicator tool for their projects. It measures comparative outcomes for green infrastructure, in terms of CO2 sequestration, water interception, oxygen production, pollutant removal (ozone, nitrous oxide and carbon monoxide) and percentage tree cover. The calculations are generated from their CAD design drawing measurements and then visualised as clear, easy-to-read graphics for clients.

<http://www.sproutstudio.com.au/research-innovation-epi-tool>

References

1. Sir David Attenborough.
<https://www.un.org/en/climatechange/take-action.shtml>
 2. Intergovernmental Panel on Climate Change (IPCC) Special Report, Global Warming of 1.5°C.
<https://www.ipcc.ch/sr15/>
 3. United Nations. Cities and Climate Change: Global Report on Human Settlements 2011.
http://mirror.unhabitat.org/downloads/docs/E_Hot_Cities.pdf
 4. New Scientists - CO2 emissions from Cement.
<https://www.newscientist.com/article/2185217-the-future-with-lower-carbon-concrete/>
 5. The earth's atmospheric CO2 concentration level is now higher than any time in the last three million years.
<https://phys.org/news/2019-04-carbon-dioxide-highest-million-years.html>
 6. IPBES 2019. Nature's Dangerous Decline 'Unprecedented'; Species Extinction Rates 'Accelerating'
<https://www.ipbes.net/news/Media-Release-Global-Assessment>
 7. IPCC Special Report on the Ocean and Cryosphere in a Changing Climate
<https://www.ipcc.ch/srocc/home/>
 8. AILA 26th August 2019 climate and biological emergency declaration
https://aila.org.au/iMIS_Prod/AILAWeb/AILA_News/2019/Landscape_Architects_Declare%20Climate_and_Biodiversity_Loss_Emergency.aspx
 9. International Federation of landscape Architects declare a climate emergency
<https://www.iflaworld.com/newsblog/ifla-declares-a-climate-and-biodiversity-emergency>
 10. Greening Australia strategy bio-diverse carbon strategy <https://www.greeningaustralia.org.au/new-carbon-farming-opportunities-will-help-us-put-new-life-back-into-the-environment/>
 11. Federal Government One Billion tree programme
<http://www.agriculture.gov.au/forestry/publications/growing-better-australia>
 12. Charles Massey on regenerative farming
<https://www.agric.wa.gov.au/managing-soils/regenerative-agriculture-presentations-dr-charles-massy-and-nick-kelly>. <https://landscapeaustralia.com/articles/call-of-the-reed-warbler-charles-massys-call-to-action/>
- Beyond Zero emissions land strategy report
<https://bze.org.au/research/agriculture-farming-land-use/>
13. Australian Council for Trade Unions congress 2018 statement on just transitions.
<https://www.actu.org.au/media/1033980/climate-energy-and-just-transition.pdf>
https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Environment_and_Communications/Coal_fired_power_stations/Final%20Report/CO5
https://www.agora-energiewende.de/fileadmin2/Projekte/2019/Kohlekommission_Ergebnisse/168_Kohlekommission_EN.pdf
 14. Australia's Biodiversity conservation strategy 2010-2030
<https://www.environment.gov.au/system/files/resources/58321950-f8b6-4ef3-bb68-6f892420d601/files/biodiversity-strategy-2010.pdf>
 15. See Wilderness society "Change the laws of nature" policy: <https://www.wilderness.org.au/work/nature-laws-that-work>
 16. Bruce Pascoe 2014. Dark Emu. Aboriginal Australia and the birth of agriculture. Magabala Books. Griffith Press South Australia.
See review here: <https://theconversation.com/friday-essay-dark-emu-and-the-blindness-of-australian-agriculture-97444>
- Indigenous Australian fire management methods.
<https://www.abc.net.au/news/2018-09-18/indigenous-burning-before-and-after-tathra-bushfire/10258140>
- Demonstrated outcomes of cultural burning associated with the 2018 Tathra fires. See also very good video link embedded in report.
<https://www.abc.net.au/news/2018-09-18/indigenous-burning-before-and-after-tathra-bushfire/10258140>
- Aboriginal land management and care.
<https://www.creativespirits.info/aboriginalculture/land/aboriginal-land-care#toc1>- 17. Some current and future technologies to meet net zero by 2050 are large scale infrastructure based projects. These will need to be have their own low carbon footprint and be sensitively integrated into the landscape. They may have implications for landscape architects in terms of strategic planning, siting, visual impact assessment, detailed design and so forth, where we become involved. Types of projects include wind farms, solar farms, pumped hydro and zero carbon heavy industry industries. At a smaller scale it may include car charging stations and street infrastructure, changes to roads due to autonomous cars etc. See Climate works pathways to deep carbonisation for indicative examples of likely projects: https://www.climateworksaustralia.org/sites/default/files/documents/publications/climateworks_pdd2050_initialreport_20140923.pdf
- 18. Low carbon communities. One example is Lochiel Park by Renewal SA.
<https://renewalsa.sa.gov.au/projects/lochiel-park/>