Planning Institute Australia

# Resource Toolkit

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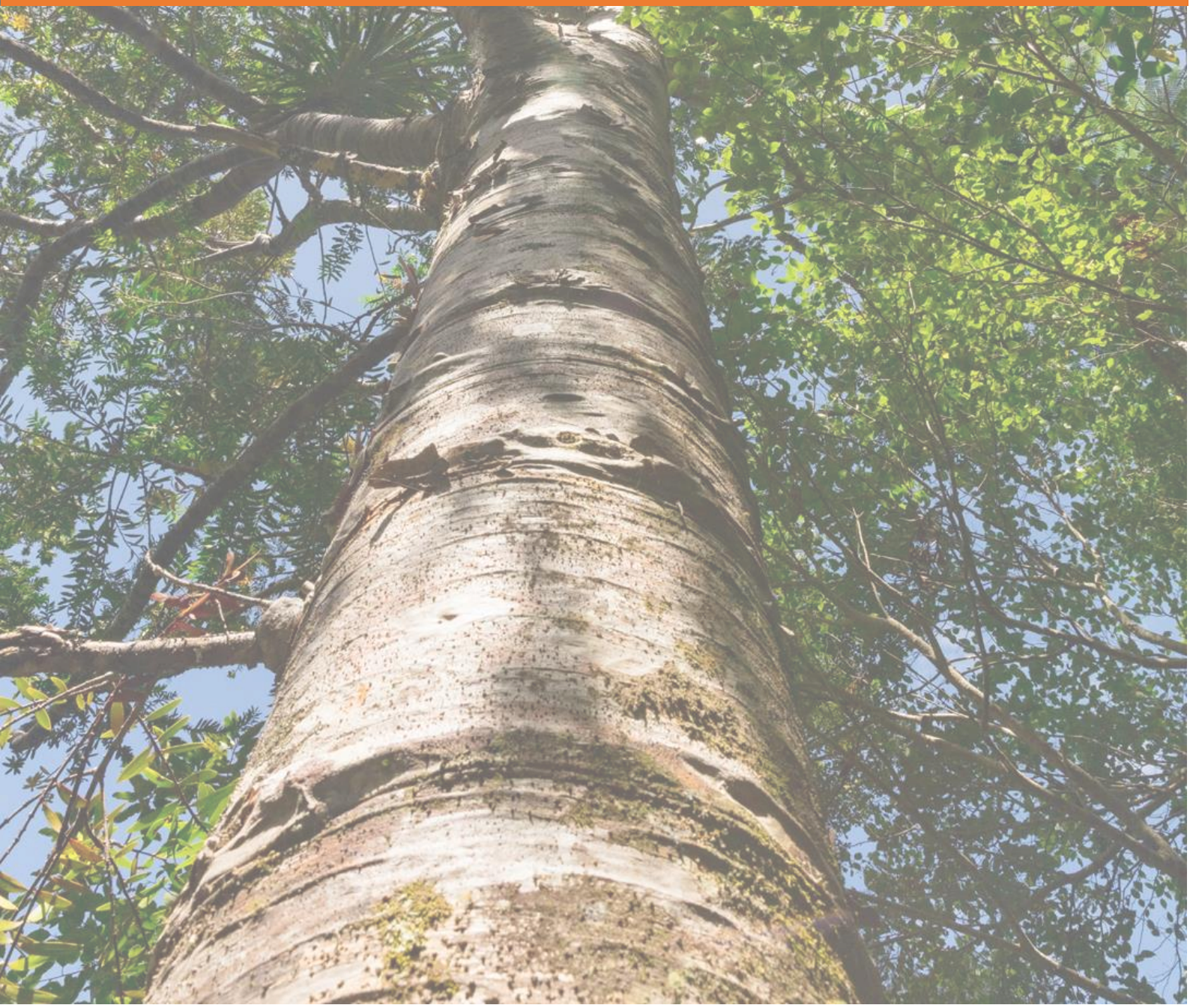
## Planning for urban vegetation in adapting to a changing climate and urban heat



# Table of Contents

# 1. Abstract

Urbanisation, one of the biggest contributors towards climate change, one consequence which is the increase in urban heat. Urban heat has considerable negative impacts, including air pollution, health hazards, increased demand for electricity, reduced urban resilience, and increased weather extremes (Byrne *et al.* 2016). Metropolitan areas such as Sydney and Melbourne are expected to experience extreme hot air temperatures in the future (AdaptNSW 2021). This toolkit provides planners with tailored information to better apply the relationship between urban vegetation, land use, and heat. It guides how planners can use information about the characteristics of vegetation on urban heat and presents existing best practices. A list of relevant key planning guidelines and the formulation of best practice standards can help planners make climate-conscious decisions, manage risks, develop planning interventions, and incorporate urban heat into planning schemes.

# 2. Introduction

Australian metropolitan areas, on average, experience a higher number of heatwaves, and the intensity and length of these heatwaves, are predicted to increase in the future(O'Neil et al. 2009). The city of Adelaide recorded the hottest temperature of 46.6 degrees (Andamon et al. 2019). The mitigation strategy of the urban heat effects via the configuration of green spaces (e.g. tree planting) and the sustainable urban design (e.g. green roof) has proven effective (Maimaitiyiming et al. 2004). Other mitigation strategies such as the implementation of cool material or materials with reflective colours that reduce heat build-up and optimise thermal comfort are also valuable in combating urban heat. However, due to the urban heat island being a relatively new issue and largely unresearched, little to no planning guideline provides a comprehensive perspective on combating urban heat. Almost every council in Australia possess their own urban greening, urban forest or urban cooling strategy. However, many of these strategies were established not for the reason of urban heat. Therefore, helping local councils or state governments to incorporate urban heat into their planning intervention is vital.

# 3. Scope

The toolkit is intended to identify and gather best practice resources in relation to urban heat and changing climate in each state and territory to assist practising planners in making climate-conscious decisions. The scope of the toolkit includes:

- Development assessment: vegetation and tree retention, landscape and greenfield development in relation to urban heat and changing climate
- Analysis of planning system: strategic planning, land use planning and development controls, design guidelines
- Assessment of planning tools and mapping

# 4. Literature review

Urbanisation is considered one of the biggest contributors to global climate change (Mohammad Harmay, Kim and Choi 2021). The urban heat island (UHI), which is highly associated with the phenomenon of heat waves, is one of the consequences of climate change (Janković and Hebbert 2012). The UHI effect is typically referred to as a higher temperature in the city district compare to surrounding suburban or rural areas, which is induced by the high density of building solar radiation absorption (Di Giuseppe and D'Orazio 2015). Heat wave (HW) event or extreme heat event, is now considered the most significant natural hazard in Australia that killed more people than any other natural disaster, posting significant risks to vulnerable people, such as elder and young people (Coates *et al.*, 2014). People in the poor heat vulnerability index regions are more likely to be affected by climate change. This is due to the heat stress are formed with the combination of social vulnerability and built form. Studies demonstrated that tree canopy cover rate is less in disadvantaged areas (Byrne *et al.*, 2016). Heat stress could trigger and increase the rate of mortality and morbidity (Maller and Strengers 2011).

Heatwave, urban heat and climate change have an interconnected relationship as climate change escalates, the severity of UHI and HW would also increase. According to IPCC (2021), when global warming increases by 1.5 degrees, the earth will likely experience longer warm seasons and shorter cold seasons and increase the intensity of heat waves. With the deteriorating climate, the HW events could intensity the UHI in the future, posing more negative impact to cities (Rizvi, Alam and Iqbal 2019). In 2004, Victoria recorded 203 heat-related deaths, Canberra had 16 days over 35°C, and the Australian Open tennis tournament was suspended due to excessive temperatures (Steffen *et al.* 2014). Penrith achieved 48.9°C on 4 January 2020 becoming the hottest place on the Earth. Parramatta is experiencing urban heat which has higher temperatures than the official record due to the increasing hard surface (concrete, asphalt, etc.).

UHI mitigation strategies were established and employed by different city councils. However, the strategy must be climate-sensitive due to different local climates and microclimates. For example, according to Low carbon living CRC (2017), Brisbane has a humid subtropical summer and experience high solar radiation intensity and UV levels; therefore, increasing tree canopy cover and shading is the best strategy. Planning intervention such as water misting to increase tree canopy work in South-western Queensland with a dry heat climate but may not be appropriate in North Queensland such as Cape or Torres with a hot and humid climate.

Tree planting or more specifically, street tree planting has proven effective to reduce the ambient air temperature in most local climate zone. The exposed building facades have the ability to gain solar heat and without the radiative shading provided by the tree, the building cooling energy needs could increase profoundly(Tsoka, Leduc and Rodler 2021). It is suggested that the reduction of building cooling energy demand is associated with the density of foliage and tree planting patterns. The tree must be mature and form a continuous shading canopy to be able to provide an optimal cooling potential (Tsoka, Leduc and Rodler 2021). City of Adelaide (2019) proposed street planting patterns in civic and commercial, mixed-used, suburban streets, industrial streets and historic streets to achieve the optimal outcomes. Street trees with hedges can reduce up to 7 degrees, 1.5 degrees median air temperature (Santamouris *et al.* 2017). Every 10% of tree canopy cover increase can result in a decrease of 1.05 degrees in summertime(Bartesaghi-Koc 2018). Increase grass cover or decreasing hard surface (e.g. concrete, asphalt) can complement the performance of temperature reduction by tree canopy. A study suggests 6 degrees of land surface temperature can be reduced by simply providing the combination of tree canopy and grasses (Ossola *et al.* 2021). Moreover, well-irrigated grasses have the ability to reduce land surface temperature up to 15 degrees, three times

more than the less irrigated grasses. Every 10% increase of well-irrigated grasses can cause a land surface temperature reduction of 0.29 degrees (Bartesaghi-Koc 2018).

A cool roof, cool wall and cool pavement have often been employed in the region with high solar radiation (Low carbon living CRC 2017). It uses cool material or reflective materials such as light colour paint, coating and roof tiles, to reflect the sunlight and heat back into the atmosphere (McKellar 2016). The surface temperature for a cool roof can reduce up to 33 degrees (Low carbon living CRC 2017). A green roof, on the other hand, is to fully or partially cover the roof with green vegetation, which could absorb the heat of sunlight before entering the building. The indoor temperature could potentially decrease up to 2 degrees which lead to an increase in indoor thermal comfort. A green roof is aesthetically appealing, also reduce noise infiltration and increase local biodiversity. However, it generates a high cost of maintenance such as the implementation of an irrigation system. A cool roof is less visually pleasant and it could cause a glaring issue due to the reflective material (McKellar 2016).

A thorough literature review is conducted and the results indicate the urban heat in Australia is a relatively new field and largely unsearched. Most of the research on the topic of urban heat emphasis a single cause or strategy. Little to no research provides a comprehensive perspective on combating urban heat. Therefore, this toolkit intends to gather examples of good practice, planning guidelines, codes and regulations, which enable the planner to view the urban heat problem as a whole and make climate-conscious decisions.

## 5. Results

The example of good practices, planning tools, guidelines and strategies that can be used to mitigate the impact of urban heat are tabulated in table 1. The formation of the table would not have been successful without the help of individuals and organisations. Therefore, we would like to acknowledge the valuable information provided by: Mr John Brockhoff and Ms Julie Brook – Planning Institute of Australia, Mr Kieron Beardmore – Brisbane City Council, Mr Dot Hepburn - Parramatta Council, Mr Jordan Koroveshi - Vincent City Council, Ms Heidi Blundy - Greater Dandenong City Council, Ms Libby Phillips - City of Melbourne, Mr Ryan McNeilly Smith - Meridian Urban, Ms Jazlyn Hopper - Town of Bassendean, Natural Hazards Team - Gold Coast City Council, Lake Macquarie City Council, Kingston City Council and Brighton City Council.

*Table 1 List of good practices, tools and guidelines to mitigate the impact of urban heat*

| Elements | Organisation | Location | Examples | Comments |
|---|---|---|---|---|
| Planning tool in relation to urban heat, changing climate adaption and vegetation cover retention | UNSW Sydney and Swinburne University | NSW | Microclimate and Urban Heat Island Mitigation Decision-Support Tool (2020) | This decision-support tool intends to mitigate vulnerability to climate change, especially urban heat and to inform urban policy, development assessment and planning practices. It also fulfils the missing link between urban microclimates' research and practical application (UNSW Sydney 2020).<br>This tool simulates and creates a 3D model in Paramatta, Green square and Macarthur area in Sydney. You can select different scenarios in the public realm (e.g. with or without street trees) and built-form to determine the air temperature distribution and UHI mitigation indicators, which assist you to make the decision to mitigate urban heat. Detailed instructions on this tool can be found here. |
| | | All AUS | Urban Heat Island Mitigation Performance Index (2020) | This tool is part of the decision-support tool project. However, this urban heat island mitigation performance index provides optimal and suitable single mitigation strategies or combinations of strategies in all Australian regions. For example, assume medium density residential in Hobart, the most suitable mitigation strategies would be water features and evaporative cooling, cool roofs, street trees planting etc. and in Darwin, the water feature is less suitable. Each mitigation strategy provides several options to ensure the most suitable outcome can be achieved. |

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| | Carole Bodilis, Komali Yenneti, and Scott Hawken | NSW | A Heat Vulnerability Index for Metropolitan Sydney (2017) | This tool can be used in conjunction with the UHI mitigation performance index. It measures the vulnerability of the population to extreme heat events in the metropolitan area of Sydney. For more information, A detailed analysis of the Heat Vulnerability Assessment in Melbourne can be found here. |
| | CRC for Water Sensitive Cities | - | Water Sensitive Cities Scenario Tool (2019) | WSC scenario tool is a planning-support tool that is mainly used by the planner to access the progression of the city's infrastructure and water networks. Recently, an urban heat island module has been added, which illustrates the land surface temperature variation. |
| | City of Melbourne | VIC | Green Factor tool (2019) | The Green Factor tool is intended to help designers and developers benchmark and optimise their green infrastructure on-lot. It is Council's preferred mechanism for demonstrating green cover (carried with Amendment C376 green cover standards which are yet to be implemented into Melbourne's Planning Scheme). The green factor tool amendment is a supplement to Amendment C376. |
| | WSROC | NSW | Urban heat planning toolkit (2021) | This toolkit intends to assist planners and local governments to make climate-conscious decisions and enhancing planning provisions to minimise the impact of urban heat. It prioritises resilience to urban heat and being able to amend LEPs and DCPs. |
| | | | Cool Suburbs Tool (2021) | This tool is intended to be a design-support tool that will help current and new projects determine the suitable urban heat intervention such as adaptation, mitigation and resilience. A similar concept as the Green Factor tool from VIC will be used to assign a 'cool rating' to the developer. It is appropriate to be used by the government to amend their DCPs or design guidelines. |
| | City of Adelaide | SA | Adelaide Design Toolkit (2019) | This toolkit well-defined the streetscape and landscape design in the city of Adelaide and its microclimate. Particularly, the greening toolkit defined the five planting schemes |
| Planning guidelines in relation to urban heat, changing | Low carbon living CRC | All AUS | Guide to urban cooling strategies (2017) | The document is one of the underpinning resources that many councils adopted. It provides practical recommendations for experts and professionals in built environments aiming to optimise development projects in urban centres throughout Australia's climatic zones in order to |

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| climate adaption and vegetation cover retention | | | | moderate urban microclimates and minimise urban heat island impact. It assesses the local climate, lowest to highest temperature and rainfall and ranks the cool paving, cool & green envelope and evaporative cooling to provide the most suitable solution. For example, in Brisbane, the best strategy for combating urban heat is to increase tree canopy and shading based on its unique microclimate. This document can be used in conjunction with Urban Heat Island Mitigation Performance Index. |
| | Greener Spaces Better Places | | Where should all the trees go? (2017) | This document specified the performance and implemented action of every induvial council in Australia based on the vegetation cover. However, a council with a great vegetation cover rate does not indicate how good their planning actions might be. |
| | | | Where will all the trees be? (2017) | This document provided a snapshot of the performance of each state in Australia based on the VHHEDA vulnerability index. |
| | NSW Government | NSW | Technical Guidelines for Urban Green Cover in NSW (2015) | This document provides practical guidelines of planning and implementing green roof, green walls, street tree planting, road surfaces and cool open spaces etc. for local government and build environment professional |
| | | | The Green Cover Demonstration Project (2011) | This document aims to provide site-specific demonstration designs for urban green cover, introduce best practice landscape design of the green cover and help local government to integrate green cover design into the planning process. |
| | CRC for Water Sensitive Cities | VIC | Trees for a Cool City: Guidelines for optimised tree placement (2017) | Tree planting is one of the most effective strategies to combat urban heat, especially street tree planting for the public realm. This document is one of the underpinning projects that provide a technical guideline on optimised tree placement to maximise the cooling effects. The tree placement location depends on the design and orientation of the streets. It is also linked with water management to ensure tree canopy retention. |
| Building codes and guidelines in relation to urban heat | City of Vincent | WA | Built Form Policy No.7.1.1 (2015) | For private land, it retains existing trees and encourages the planting of new trees by requiring a certain percentage of canopy cover based on the development type. It also provides for reduced 'deep soil area' where mature trees are retained on site. So it uses a mix of both regulatory |

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| | | | | measures and incentives. It has been prepared under the provision of Vincent planning scheme 2015. |
| | Brisbane City Council | QLD | Buildings that breathe (2016) | Both documents recognise the urban heat issue. By encouraging developers to adopt vertical greenery, elevated gardens and internal planting concepts to mitigate the urban heat island effect. Greenery as a mitigation and adaptation strategy to urban heat provides a comprehensive review of the importance to use greenery as a strategy to combat urban heat. |
| | | | QDesign (2018) | |
| Cooling surface and infrastructures in relation to urban heat | Adelaide city council | SA | Cool Road Adelaide (2020) | This document specifies and provides a guideline on cool road sealants in Adelaide and can be used in conjunction with CRC for Water Sensitive Cities Scenario Tool. |
| | Santamouris, Synnefa and Karlessi | - | Advanced cool materials (2010) | This review article assessed the cooling effect of material with high solar reflectance and subsequently, establish a mitigation strategy. This is one of the underpinning papers. |
| | Santamouris | - | Cooling the cities (2012) | This review article assessed the performance of green roof mitigation strategies to combat urban heat. It is also one of the underpinning papers. |
| Urban cooling, greening and forest strategy in relation to urban heat | The Nature Conservancy and Resilient Melbourne | VIC | Living Melbourne (2019) | Melbourne prepared a detailed plan that support Melbourne's strategic planning goals and visions. Victoria's Climate Change Adaptation Plan, which is highly relevant to the Living Melbourne plan, describes the actions the government will take to assist with adaption and coordination at various regional levels. A detailed urban heat mitigation strategy has been included. A discussion paper on Living Melbourne can be found here. The City of Melbourne developed an Urban forest strategy: making a great city greener which also endorse the Living Melbourne plan. |
| | City of Sydney | NSW | Greening Sydney Strategy (2021) | The city of Sydney has developed a comprehensive urban greening strategy that includes vegetation cover target, access to green spaces, cool street, green factor and a community engagement plan. This strategy adopts the green factor tool in Melbourne. |
| | Greater Sydney Commission | NSW | The Pulse of Greater Sydney 2020 | This document demonstrated the value of indicators that reduce the impact of urban heat such as tree canopy and vegetation. It measures the hottest day within greater Sydney regions and addresses the impact of urban heat, aiming to increase urban tree canopy cover to create Greater Sydney Green Grid. |

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| | Lake Macquarie city council | NSW | Urban greening strategy (2021) | LMCC's urban greening strategy is undergoing development, which will be adopted by the council in the short future. An online survey was filled by over 42000 residents to understand what the local residents care about the most and determine the priority of location to implement the greening strategy. This approach is fairly effective and targets the most urgent topics. |
| | Queanbeyan-Palerang Regional Council | NSW | Urban Forest and Cooling Strategy (2021) | QRPC is one of the councils that are leading the way to combat urban heat, a supporting news article can be found here. The cooling strategy is developed based on Surface Heat Mapping Report. |
| | Penrith City Council | NEW | Cooling the city strategy (2015) | The strategy integrates several aspects including green infrastructure, water sensitive urban design, policy and planning controls, and education to combat urban heat. It also identifies the responsibility of relevant agencies. Council's Organisational Performance and Development (OPD) Department will be monitored the implementation. Increase greenery and shading and installation of water features is the main strategy to mitigate the impact of urban heat. The study shows that more than 2 degrees can be reduced. The supporting article can be found here |
| | Gold Coast City Council | QLD | Urban Tree Canopy Study (2020) | This study won the Landscape Planning category award at the 2020 QLD Landscape Architecture Awards and the 2020 National Landscape Architecture Awards. It prioritises planning and policy reviews. The street tree planting and streetscape development approval conditions will be under review. It sets a canopy cover target setting and prioritises on-ground urban greening actions. One of the documents used to underpin the development of the Urban Tree Canopy Study is CSIRO's Estimation of Land Surface Temperature and Urban Heat Island effect for Australian urban centres report |
| | Moreland City Council | VIC | Moreland Urban Heat Island Effect Action Plan (2017) | This action plan reviewed existing planning frameworks and policies and incorporate them with urban heat island mitigation. It indicates the promotion of vegetation cover and cool buildings, cool roads. |
| | City of Kingston | VIC | Creating a Cool Kingston (2020) | The city of Kington acknowledges the importance of combating urban heat. It aims to increase tree canopy cover and integrate urban heat mitigation |

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| | | | | strategy in planning and building codes and guidelines, e.g. use of cool materials. |
| | City of Vincent | WA | Greening plan (2018) | This plan is mostly designed for public land vegetation. It sets tree canopy cover and indent to develop a green community. |
| | Greater Dandenong City Council | VIC | Climate Change Emergency Strategy (2020) | Greater Dandenong City Council has recently adopted the climate change emergency strategy and declared a Climate and Ecological Emergency, committing to emergency action on climate change. Council's vision is to become a resilient, net-zero carbon emission city with an active community prepared for the challenges of a changing climate. |
| | | | Urban Forest Strategy 2021–28 (2021) | The *Urban Forest Strategy* encompasses the *Greening Our City: Urban Tree Strategy 2018-28* and the *Greening our Neighbourhoods Strategy 2021-28*, and considers the current issues and opportunities for canopy cover across the municipality |
| | Town of Bassendean | WA | Tree Retention and Provision (2020) | In 2020, the Town acknowledged the impact of urban heat and introduced a local planning policy that aims to increase canopy cover on private property, which ensures canopy cover extends mid-block as opposed to within the road reserve only. The Policy also provides guidance for Tree Preservation Orders, which are contained within Local Planning Scheme No. 10. |
| Strategic planning and planning scheme amendment | City of Parramatta | NSW | Local Strategic Planning Statement (2020) | The impact of urban heat island is acknowledged in the city of Parramatta's strategic planning. It is one of a few councils that officially adopt urban heat in the planning documents. Urban heat stress is classified as council policy direction, planning priority no.16. |
| | City of Melbourne | VIC | Amendment C376 green cover standards (2020) | The amendment seeks to incorporate minimum mandatory ESD, urban cooling and green cover provisions in Melbourne's planning scheme |
| | Brisbane City Council | QLD | Major amendment package G (2021) | To minimise the impact of urban heat, a citywide rooftop garden initiative has been amended into the Brisbane planning scheme to ensure the rooftop garden is integrated into the overall building design. It promotes the provision of rooftop gardens that exclude from the maximum height of building in medium to high-density areas, which support the mixed-use of high-rise development. |

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| Urban heat, vegetation cover and heat vulnerability index mapping | NSW Government | NSW | SEED – Urban Heat Island Effect Maps (2021) | Sharing and Enabling Environmental Data (SEED) map contains numerous datasets. It covers most areas in New South Wales. In the SEED map, you can view individual layers as shown in the examples or add all layers on the same map to use it interactively. |
| | | | SEED – Urban Vegetation Cover Maps (2021) | |
| | | | SEED – Heat Vulnerability Index Map (2021) | |
| | City of Parramatta | NSW | Parramatta Heat Maps (2015) | Unlike the SEED map that only provides an overview of urban heat in NSW, the Parramatta heat map provide more detailed data specifically targeted in the City of Parramatta LGA. Day and night maps that allow you to identify urban heat hot spots very easily. In Benchmarking Heat in Parramatta, Sydney's Central River City, a thorough analysis of Parramatta's microclimate have been conducted. |
| | State Government of Victoria | VIC | Cooling and Greening Melbourne Interactive Map Tool (2018) | This map is well-designed and user-friendly. It covers the metropolitan area in Victoria. The dataset contains vegetation cover, urban heat, and the heat vulnerability index that can be used interactively. The correlation between urban heat and vegetation cover can be easily mapped and determined. Click here for more information about data collection details and methodology |
| | City of Melbourne | VIC | The Rooftop Project maps (2020) | The Green Our Rooftop project is one of the most important actions from Green our city strategic action plan 2017–2021. It provides an explorative GIS Rooftop Map interface with information around the potential of green rooftop and solar PV retrofitting in Melbourne. |

# 6. Discussion

The research involves literature reviews, calling and emailing of practising planners and associated professionals in the industry. We interacted with planning experts in councils, state government, and the private sectors across Australia to determine those with best practices. All the strategies listed here are carefully selected to serve different purposes, as they were developed to solve unique problems that reflect the culture and climate of their localities. However, the following initiatives are worthy of emulation:

- The Green Factor tool, developed by the City of Melbourne to assess green infrastructure in a megacity like Melbourne. This assessment guides the design and construction of new buildings that are environmentally friendly and include green infrastructure. It forms a part of work to respond to the climate and biodiversity emergency invented by the Melbourne City Council, which can be adopted nationwide.
- The Urban heat planning toolkit is an initiative of The Western Sydney Regional Organisation of Councils' (WSROC). This project has been lauded by the New South Wales Government and Local Government NSW as a great invention to fight urban heat and heatwaves, which have become a significant and growing issue for Western Sydney. This toolkit has been developed to help local government strengthen their planning provisions to reduce the impacts of heat across Sydney.
- The Guide to urban cooling strategies is a tool that provides practical guidance for built environment professionals and regulatory agencies seeking to optimise development projects to moderate urban microclimates and mitigate urban heat island effects in major urban centres across a range of climates in Australia.
- The Living Melbourne is a strategy that demonstrates a metropolitan urban forest technology programme for a bold new step to promote a greener and more liveable city such as Melbourne. It presents a vision of international significance in its massive scale, outstanding collaboration, and use of new and innovative mapping technology.
- Cooling the city strategy by Penrith City Council. This strategy draws upon existing works, programs and already adopted strategies on urban cooling in the council, as well as recommendations from expert consultants' reports to make suggestions for various cooling activities.
  The strategy shows the importance of vegetation retention through tree planting and landscaping as one of the most successful approaches being taken across the world to reduce urban heat.

Overall, we observed that:

- Most councils have good urban vegetation retention strategies to combat the changing climate and urban heat but lack the necessary financial supports of the concerned authorities to become realities.

- A lot of councils assigned the formulation of these climate change resilience strategies in combating urban heat to architects, landscape professionals, environmentalists, and engineers. Because these strategies were formulated without the input of planners, the interventions often do not directly translate into any relevant planning system.

- Many of these climate-conscious strategies are not developed in planning contexts by their sources. They are not incorporated into planning schemes to strengthen their application on existing and proposed developments.

- Some of the strategies do not consider the public input. They lack their immediate community engagements and the cooperation needed to materialise.
- Most of these strategies were developed on a local council level. Very rarely is there is a state or federal planning document on tackling climate change and urban heat, and if any exists, they are just guidelines that are not so comprehensive.

# 7. Recommendation

The commonwealth government may need to lead on developing a nationwide or national level of guideline for vegetation retention. For instance, there is a Technical Guidelines for Urban Green Cover in NSW that was developed by the NSW State government. The guideline offers built environment professionals working in state and local government and the private sector practical information and details to encourage best practice applications of green cover to minimise urban heat impacts across NSW. The guidelines include practical information for planning and implementing green cover in consultation with urban design and engineering professionals, utilities and relevant stakeholders.

Governments on all levels in Australia can increase their budgets for the environment. Singapore has a nationwide initiative tagged 2015 Guide to Singapore Government Funding and Incentives for the Environment | Green Future. The purpose of this programme is to accelerate the growth of the environmental industry and to maintain Singapore's image as a City in a Garden. The Singaporean government has initiated several fundings and incentive schemes related to energy efficiency and clean energy, green buildings and construction, water and environmental technologies, green transport and shipping, waste minimisation, environmental initiatives, and capability development.

Community engagement should be seriously considered when developing climate change strategies. For instance, Lake Macquarie sought feedback from the local community to prepare a draft for her Urban Greening Strategy in the form of a survey and Social Pinpoint map, by asking people to share areas they think need more greening, current green spaces they love, and ideas for community greening initiatives. This invention increased the likelihood that the projects be widely accepted and supported. Local engagements will also create a more effective solution, improve public knowledge and skills in urban heat problem-solving. Similarly, grassroots involvement will empower and integrate people from different backgrounds and create a local network of community members.

Councils should encourage and increase the participation and input of planners in the development of strategies to combat urban heat. Climate resilience interventions should not be left alone in the care of planning-aligned professionals.

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