Submission No 85

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

Organisation: Sweltering Cities

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Submission to the inquiry on the Planning System and the impacts of climate change on the environment and communities

Sweltering Cities[1] is a Non-Government Organisation (**NGO**) that advocates and campaigns for improved and equitable living conditions in communities across Australia. We operate at the grassroots level, striving for sustainable cities, and improving health in the face of climate change inequity. Having started in Western Sydney, we understand the disproportionate impacts of climate change and notably, heat and heat-related illness, on the people of Western Sydney.

It is our belief that future urban infrastructure for the state must consider the ongoing and increasing effects of climate change, with the impacts on human health and wellbeing at the forefront. Three converging issues reinforce this imperative: urban temperatures are rising and heatwaves are becoming more frequent, intense and longer lasting, inequality and the housing affordability crisis are increasing economic precarity, and two major heat-vulnerable groups are increasing – that is, people with chronic disease and aging populations. Planning system reforms can significantly help reduce the heat-vulnerability of communities across the spectrum of heat exposure, sensitivity and ability to adapt[2].

Sweltering Cities believes that our planning system should comply with two overarching goals:

1. **All new buildings and developments should be safe in a future climate.** This includes protecting residents from the health impacts of extreme heat.
2. **All new buildings and infrastructure need to support a net zero carbon emission target by 2050 at the latest.** NSW will legislate the net zero target in 2023 and it would be counterproductive to continue building in a way that will require more carbon, time and cost to retrofit in the future.

We have these specific proposals:

- Ensure Planning regulations and tools utilise current and future climate data. Currently, the Planning system uses climate data from 1990 to 2015, which excludes the eight hottest years on record. We should not be building for a climate that no longer exists.
- A comprehensive ban on new black or dark coloured roofs in Western Sydney. Dark roofs can be over 40° hotter than local air temperatures, increase the temperatures inside homes on hot days, and exacerbate the urban heat island effect (UHI). Recent

[1] https://swelteringcities.org
[2] Hossain MA, Kujala H, Bland LM, Burgman M. and Lahoz-Monfort J. 2019, 'Assessing the impacts of uncertainty in climate-change vulnerability', Diversity and Distributions. 2019;25:1234–1245.;
Garnaut R. 2008, 'The Garnaut Climate Change Review - Final Report', Cambridge University Press, Melbourne, available: http://www.garnautreview.org.au/index.htm#pdf

updates to the BASIX system have prevented people in Sydney who are using the DIY planning tool to include black roofs in their design. Any new black roofs are inconsistent with the goal of cooling the city, preventing heat deaths or transitioning rapidly to a clean energy future.

- The previous Government set a target of 40% green coverage on average across Sydney. Under this system, high levels of green cover in North Sydney would offset the low levels in South West Sydney for example. This target should be replaced by localised targets that will increase the green cover in hot suburbs where it is needed most. In order to achieve this, maintaining existing trees must be a priority. Additionally, new developments or precincts should all have a minimum of 40% green cover in order to meet those goals.
- No new developments should exacerbate the UHI effect. This can be achieved through utilising green and blue infrastructure, building materials and increasing public transport usage to limit the need for large expanses of dark asphalt roads.
- Create design standards that promote active and public transport.
- In every individual lot, there should be space for trees that provide shade and cooling.
- Rainwater tanks in apartment buildings to maintain local trees and landscaping. Rainwater storage should be connected to irrigation or other outdoor uses as implementing sustainable irrigation opportunities can mitigate the impacts of heat.

The case for Western Sydney

Global warming and anthropocentric climate change have led to higher maximum temperatures across our state have been increasing over the past 30 years[3] with higher average temperatures (over 35^{o}C) becoming much more common in Western Sydney specifically.[4] There is an inherent disparity in the negative effects of heat across Metropolitan Sydney, with maximum temperatures being up to 10^{0}C warmer in Western Sydney compared with coastal regions.[5] Poorly planned development, together with a lack of cooling sea breezes, contribute in part to this concerning heat disparity between inland Western Sydney and coastal Sydney[6].

Temperatures of over 50° have been measured by Dr Sebastian Pfautsh and his team at WSU. The ‘Benchmarking summer heat across Penrith’ project found that:

- Maximum air temperatures of more than 50°C were recorded at six locations
- The number of days with air temperatures at or above 35°C was far greater across the LGA (39 days) compared to the measurements from the official weather station (24 days).

Rapid urbanisation and the removal of tree coverage in Western Sydney are central to the urban heat island effects witnessed in the region, however identifying the climate drivers that also influence maximum temperatures is equally crucial for infrastructure development and planning. The distance of the region to coastal winds and surrounding seas implicitly increases average temperatures, however it is acknowledged that this geographic

[3] UTS, 2023 https://www.uts.edu.au/news/social-justice-sustainability/extreme-heat-getting-worse-west
[4] The Conversation, 2023 https://theconversation.com/why-western-sydney-is-feeling-the-heat-from-climate-change-more-than-the-rest-of-the-city-201477
[5] UTS, 2023
[6] Speer et al. 2023

disadvantage may be countered through effective urban planning by Local and State Government (via the ways listed below).

Furthermore, the removal of trees (which shade services and allow water vapour to cool air), greenspaces and parklands has resulted in replacement with man-made structures and buildings of bricks, cladding, metal and glass. Waterways such as lakes and rivers in the region, which act as temperature buffers to convert heat to cooling vapours, are replaced by asphalt and concrete which can reach 80°C surface temperatures.

Economic development coupled with being one of the fastest growing urban populations in Australia,[7] and higher concentrations of buildings and man-made surfaces have caused the retention of heat and the Urban Heat Island effect.[8] Urban heat islands exacerbate the effects of Climate Change creating more severe and frequent instances of hot weather events, placing more people at greater risk of exposure to a heat-related illness.[9] Scientific literature has established a linear relationship between high mean temperatures and mortality risk, which is a key concern as climate warming progresses. [10] For Western Sydney, rates of chronic disease are relatively higher than for other parts of Sydney, making communities in the west more vulnerable to heat-health impacts (SWSPHN)[11].

Extreme heat not only has direct impacts on health and wellbeing, but there are also confounding indirect impacts on the cognitive and physical development of children, particularly due to exposure at school or from playgrounds.[12] A study in the US found that for every 1°C increase in annual average classroom temperature, this resulted in a 2% decrease in student learning outcomes.[13]

We ask the NSW Government to commit to planning legislation reforms that align with the three priorities identified by public health specialists for reducing heat-vulnerability:

1) reduce urban heat (exposure)

2) reduce chronic disease (sensitivity) and

3) support the social nature of the city (adaptive capacity)[14]

Reducing urban heat

The social burden of increasing temperatures and heatwaves can be diminished through interventions which limit excess heat in urban environments, including[15]:

a) effective urban planning,
b) prioritisation of green space,
c) planting of appropriate vegetation,

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[7] Climate Council, 2021 https://www.climatecouncil.org.au/urban-heat-island-effect-western-sydney/
[8] The Conversation, 2023
[9] NSW Planning, 2023 https://www.planning.nsw.gov.au/policy-and-legislation/resilience-and-natural-hazard-risk/urban-heat
[10] Chaston T B, Broome R A, Cooper N, et.al. Mortality Burden of Heatwaves in Sydney Australia is exacerbated by the Urban heat island and Climate Change: Can tree cover help mitigate health impacts? Atmosphere, 2022: 13(714). Doi: 10.3390/atmos13050714

[11] South Western Sydney Primary Health Network (SWSPHN) no date, 'SWSPHN Local Health Forum - Chronic Disease: Co-design summary report', available: https://swsphn.com.au/wp-content/uploads/2023/07/2023SWSPHN-LHF-report-chronic-disease.pdf
[12] Climate Council, 2021
[13] Harvard Kennedy School, 2018 https://www.hks.harvard.edu/announcements/when-heat-student-learning-suffers
[14] Bambrick HJ, Capon AG, Barnett GB, Beaty RM, Burton AJ. 2011, 'Climate change and health in the urban environment: adaptation opportunities in Australian cities', Asia Pacific Journal Public Health.23(2 Suppl)

[15] Chaston, et.al., 2022, 'Mortality Burden of Heatwaves in Sydney, Australia Is Exacerbated by the Urban Heat Island and Climate Change: Can Tree Cover Help Mitigate the Health Impacts?', Atmosphere 13, 714.

d) increasing tree cover, and
e) using materials with high albedo (light reflection, light surfaces).

The 'Guide to Urban Cooling Strategies' developed by the 'Low Carbon Living CRC' reinforces the need for place-specific cooling strategies. The guide provides an 'urban cooling toolkit' for cool materials, permeable paving, built and natural shade, greening and water misting. Strategies identify the importance of enabling ventilation (natural breezes, street orientation and urban form) to remove urban heat, and that vegetation must be hydrated to provide evaporative cooling. Place-specific climate interventions of direct relevance to development and planning are given for Sydney (central and eastern suburbs) and Parramatta (and Sydney's western suburbs), as well as other major Australian cities[16].

The Urban Heat Island effect (UHI) and a lack of green cover across the city has been found to be linked to increased mortality in Sydney. A 2022 study found that:

> *… data show that >90% of heatwave days would not breach heatwave thresholds in Sydney if there were no UHI effect and that numbers of heatwave days could increase fourfold under the most extreme climate change scenario. We found that tree canopy reduces urban heat, and that widespread tree planting could offset the increases in heat-attributable deaths as climate warming progresses.*[17]

Reducing chronic disease

Well designed and planned cities are essential to helping reduce heat-health risks associated with chronic disease through encouraging people to walk, cycle, participate in physical activity and use public transport. Planning reforms need to ensure public spaces, such as streets, parks and plazas, are cool, green and comfortable for outdoor activity during hot weather. Cool public spaces are priorities in disadvantaged areas where housing quality is poor and private greening is limited. Public spaces should be particularly inviting for heat-vulnerable groups, catering to the specific needs of older people and those with disabilities. Nighttime lighting is essential to supporting people being active during the cooler parts of hot days[18].

Healthy built environment checklists and walkability audits provide critical guidance for developing health-supportive environments (NSW Ministry of Health 2020; Victoria Walks 2023). Specific considerations for hot conditions include frequently spaced, shaded rest stops along major paths to help people adjust to hot conditions, microclimatic choice for sitting and staying activities, and free, potable water[19].

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[16] Osmond P and Sharifi E. 2017, 'Guide to Urban Cooling Strategies', Low Carbon Living CRC, available: https://www.lowcarbonlivingcrc.unsw.edu.au/sites/all/files/publications_file_attachments/rp2024_guide_to_urban_cooling_strategies_2017_web.pdf

[17] Hanigan, Ivan & Morgan, Geoffrey & Perkins-Kirkpatrick, Sarah & Zhang, Ying & Ji, Fei & Dissanayake, Gnanadarsha & Chaston, Timothy & Broome, Richard & Cooper, Nathan & Duck, Gerard & Geremboux, Christy & Guo, Yuming. (2022). Mortality Burden of Heatwaves in Sydney, Australia Is Exacerbated by the Urban Heat Island and Climate Change: Can Tree Cover Help Mitigate the Health Impacts?. Atmosphere. 13. 10.3390/atmos13050714.

[18] McKenzie L. 2022, 'Remaking Public Space for Cooler, Greener Outcomes - a case study from Western Sydney' in Y. Yang and A. Taufen (ed.), 2022. 'The Routledge Handbook for Sustainable Cities and Landscapes in the Pacific Rim, Routledge', London

[19] McKenzie L. 2022, 'Remaking Public Space for Cooler, Greener Outcomes - a case study from Western Sydney' in Y. Yang and A. Taufen (ed.), 2022. 'The Routledge Handbook for Sustainable Cities and Landscapes in the Pacific Rim, Routledge', London

Supporting the social nature of the city

Social isolation is a major heat-risk, especially for older people who may live alone, have chronic illness, and lost family and friends[20]. Healthy planning approaches recognise that design and planning play significant roles in encouraging community interaction, both incidental and organised, and strengthening social connectedness, such as neighbours looking out for neighbours[21]. Similarly, well designed and planned public spaces can help reduce heat-vulnerability through strengthening the social nature of the city.

We have attached additional community comments to this submission. We also urge the Committee to consider the submissions from WSROC, Dr Sebastian Pfautsch, and the Nature Conservation Council in this inquiry. We recommend that the Committee seek advice from the Western Sydney Heat Taskforce in reducing the impact of extreme heat in NSW.

We commend the committee once again for conducting this Inquiry and for the opportunity to provide a submission. Should you like to discuss our submission, or any other information, please do not hesitate to contact us at info@SwelteringCities.org

[20] Orlando S et al, 2021, 'The Effectiveness of Intervening on Social Isolation to Reduce Mortality during Heat Waves in Aged Population: A Retrospective Ecological Study', Int. J. Environmental Research and Public Health 18, 11587

[21] NSW Ministry of Health 2020, 'NSW Healthy Built Environment Checklist: A guide for considering health in development policies, plans and proposals', available: https://www.health.nsw.gov.au/urbanhealth/Publications/healthy-built-enviro-check.pdf

Community Comments

These comments have been gathered by inviting comments from community members, or selecting relevant comments from the 2022 Sweltering Cities Summer Survey.

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I live in Castle Hill and see every day the housing developments which are part of the North West sector development which aims to eventually build housing for 300,00 people in this area. The early developments such as Beaumont Hills have become suburbs which are desirable places to live. They have streets which are wide enough to accommodate avenues of trees and a variety of housing stock. The more recent developments have no room for trees or much vegetation at all. As well as this the roofs are all made of charcoal grey tiles. Temperatures this far from the coast are appreciably higher than they are in the seaside suburbs. Our planning laws give no attention to the role that hard surfaces and dark surfaces contribute to increasing the ambient temperature in areas built in this way. Where I live there are plenty of trees and gardens instead of paved surfaces. This makes for a much more pleasant environment on a hot day. Not only does it reduce the number of days it is necessary to turn on the air conditioning, it is also pleasant to walk around the area. No one will walk anywhere when the temperature is above 30 degrees thus increasing our dependence on cars for transport.

It seems that our present Planning laws not only encourage development which is inappropriate for a warming climate but they give no encouragement to residents to retain the trees which already exist. It is too easy for homeowners to cut down mature trees which provide shade and wildlife habitat because they don't want to have to rake up the leaves, they are afraid of falling branches or they don't want to lose the view. There needs to be a public education program which promotes the benefits of trees. Sydney should follow Singapore's example and become a green city.

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More regulation around block sizes and planting of larger growing trees is needed if we hope to keep our suburbs liveable. Compare inner Sydney suburbs to new developments in Western Sydney and it becomes clear to see why we suffer in summer and they don't. Our blocks are built within touching distance of one another, the roofs of our houses are black and the lack of tree canopies makes it worse. Look at any aerial map and you will see suburbs near the CBD are much more leafy, have larger growing trees providing shade and privacy. These suburbs were nothing revolutionary, instead Governments got greedy with block sizes, shrinking them down and putting the largest house on them to maximise profits. Faster and taller growing trees should be mandated for all new developments and incentives should be given to plant trees for existing households.

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I would love more trees and clean natural water holes, rivers, creeks, for kids to play in.

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New suburbs should take into consideration the orientation of homes and rooms to ensure houses/rooms are kept as cool as possible and not taking the full force of the summer sun and residents needing to use more resources to cool their home

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Leave large trees where possible in new suburbs. Encourage larger block subdivisions so owners can plant larger trees in their own yards. Continue developing park areas across Penrith with extensive shade areas.

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I am very concerned about new housing developments not considering the Australian climate. Minimal trees, poor quality materials and designs.

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Trees trees trees! There's plenty of nature strips in my suburbs but not a single tree on them! Also there's should be minimum requirements for green space per suburb. I live near a block that has only trees, this is great, means large trees can grow on a residential street without becoming a problem for homeowners… too many parks though lack shade trees, take amaroo street reserve, why aren't there trees planted here? And a long the train corridors? They don't have to be gum trees either (worse trees to have in a suburb)

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The costs of living is just becoming to much, single parent (not by choice) working full time and I'm still struggling with the heat, I don't drive so accessible and close public transport is so vital and it's just not something that has happened in Cranebrook

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I feel like the way the built environment locks us into car dependent patterns insulates some people from the true experience of heat, as we go from air conditioned houses to air conditioned cars to air conditioned shopping centres. We would have a very different attitude to what we accept in our suburbs if we didn't have all those air conditioned spaces.

Also I feel like the importance of mapping areas with high humidity and high temperature hasn't really been recognised yet. Penrith gets bloody hot, yes, but that heat often comes with intense humidity as well which is the killer at night and ruins sleep and prevents proper rest.

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Western sydney airport will increase heat. This is insanity. Development should be more focussed on providing accessible green space rather than small blocks crammed together increasing UHIE, even if that means better planned multi storey. Thornton Penrith is bad planning, should have pools, communal cool spaces, solar etc

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My home is notably cooler than surrounding homes (according to a council heat map). This is because of big trees. Yet Council approves DAs removing mature trees and permits replacement with shrubs or grasses. So frustrating.

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Spaces between buildings (i.e. roads, footpaths, etc) should NOT be minimised. Wind needs to circulate to cool buildings and "enclosed" areas. Too many apartment blocks build right to boundaries so that there is only a metre between buildings. Apartment blocks need cross ventilation and balconies

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