

# Medium-density housing robs suburbs of street and garden trees in Australian neighborhoods

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New housing subdivisions, smaller yards and a dependence on air conditioning have resulted in a 30% decline in Australian residential

trees in the past decade, leading to hotter neighborhoods and increased energy costs.

The dramatic loss of suburban trees has led to UniSA environmental researchers calling for new national planning policies to mandate the inclusion of trees in any development or housing design.

Qualified architect and UniSA Ph.D. candidate Mina Rouhollahi says a recent study of 90 Australian residential suburbs shows tree-inclusive gardens and yards provide up to a 30-meter buffer around each land unit during summer heatwaves.

"Deciduous trees, in particular, provide summer shade, while their bare branches allow heat to penetrate into the house in winter," Rouhollahi says.

"Local government focuses on [public parks](#) and urban forests but it's the residential trees that make a significant difference to home [energy costs](#). Also, private land tree planting provides a better environment for children, improving urban aesthetics and increasing home values."

Rouhollahi and her UniSA colleagues, including supervisor Professor John Boland, have designed an optimal tree strategy for different housing configurations, nominating specific tree types, tree volumes, and correct placement to achieve maximum benefits.

Their strategy is outlined in a new paper published in *Energy and Buildings*.

It incorporates all seasons and microclimates, allowing planners, developers and designers to adopt the tree options that suit specific environments.

Their research recommends five optimal tree arrangements depending on deep soil availability and space.

"We need a more cohesive urban planning approach to compensate for residential tree loss in recent decades and regulate heat as well as curb energy costs," Prof Boland says.

The researchers' proposal aligns with the latest IPCC report, recommending increased space between houses to allow for more trees, as well as utilizing reflective building materials. The report says taking these steps could significantly decrease urban heat, reduce the reliance on electricity, and thereby cut blackout risks.

A major challenge, however, is to change Australians' attitudes, increasing the focus on home energy efficiency through appropriate tree planting, double glazing and better house design, moving away from [air conditioning](#) reliance.

"Australians have the power to influence the design process, requesting tree allocation when building or buying their home, in the same way they insisted on a double garage in the 1990s. The focus has shifted to boosting our wellbeing and the role that trees play in this," Rouhollahi says.

"Redesigning our homes with trees in mind will better serve residents, cities, and the environment. Trees have numerous benefits: they shield us from the sun, provide wind protection, reduce stormwater runoff, passive cooling and natural ventilation. The net result is a more energy efficient home, lower energy costs, reduced air conditioning, CO<sub>2</sub> emissions and less polluted air."

Current residential development policies rely on public and communal open spaces to compensate for the lack of trees in private yards. Yet, this

does not provide [energy](#) savings, the researchers say.

The researchers hope their recommendations, outlining different optimal tree options, will be adopted by local councils and embedded in their planning policies.

**More information:** Mina Rouhollahi et al, Potential residential tree arrangement to optimise dwelling energy efficiency, *Energy and Buildings* (2022). [DOI: 10.1016/j.enbuild.2022.111962](https://doi.org/10.1016/j.enbuild.2022.111962)

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