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Temperate cities do not need to copy Singapore's dependence on air-conditioning, says climate scientist Winston Chow.

Winston Chow

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SINGAPORE: As swathes of Europe and North America sweltered in a heatwave, Elon Musk called Singapore's founding prime minister Lee Kuan Yew a "genius" for recognising how air-conditioning shaped Singapore's development.

Mr Lee's point was practical: In the tropics, cooling made offices usable, civil servants productive and modern administration possible.

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That history matters, but it can mislead when viewed through today's Northern Hemisphere heatwaves.

There is now a temptation to conclude that every European home should learn from Singapore by buying an air-conditioner. But the topic is a political football for countries such as France, Germany and the UK, where resistance to air-conditioning is stronger because of strict building codes and environmental concerns.

CAN EUROPE ADAPT?

Air-conditioning matters, especially as the world gets hotter. The last Intergovernmental Panel on Climate Change (IPCC) report assessed that heat extremes will become more frequent and intense with further warming. At 2°C, changes in extreme heat intensity would be at least double those at 1.5°C; at 3°C, they would be quadruple.

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The question for temperate cities now is whether their buildings, infrastructure and institutions will adapt before heat becomes a routine public health emergency.

Much of Europe's housing, schools, hospitals and transport infrastructure was built for cold protection. Insulation saves lives in winter but can trap heat in summer. Stone, asphalt and concrete store heat by day and release it at night through the urban heat island effect.

Rail lines, power systems, roads, care homes and hospitals can fail under temperatures they were not designed to withstand.



Air-conditioning therefore deserves a serious place in climate adaptation policy. It saves lives, protects medical care and keeps schools, workplaces and homes usable. But it also raises a hard equity question: Who gets cooled?

The IPCC has noted that heat risk is differentiated. A cooling divide emerges when wealthier households can buy thermal safety while poorer households face hotter homes, higher health risks and fewer options.

HEAT-SMART STRATEGIES MUST BE HOLISTIC

Singapore is useful here not because it has perfected cooling. As locals know, many indoor spaces are overcooled. I have lost count of friends and colleagues who carry a cardigan or sweater to the office or mall because of arctic air-conditioning.

The real lesson is that heat, like other climate risks, must be managed as a system. Singapore's strength lies in a portfolio of responses that reduces heat exposure, protects vulnerable groups and avoids treating air-conditioning as the only answer.

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Singapore's National Heat Resilience Strategy combines climate projections with long-term urban development. The country cannot slow global warming on its own, but it can reduce local heat risks through long-term planning, finance, design and public health measures.

These include precincts designed for airflow and ventilation, more green and blue spaces, cool materials on building surfaces, and efficient systems such as district cooling.

They also include heat advisories, public education, and support for outdoor workers, the elderly and low-income households.

This portfolio approach is also supported by research from the Cooling Singapore Initiative, led by SMU, NUS, NTU, ETH and other universities. In a recent paper, we argued for heat-smart strategies in hot and humid cities; not single solutions, but measures that address hazard, exposure and vulnerability together.

The UN Environment Programme found that global cooling demand could more than triple by 2050 under business as usual, pushing cooling emissions to 7.2 billion tonnes of carbon dioxide-equivalent a year.

A sustainable cooling pathway combining local heat assessments, heat action plans, passive cooling, efficient technologies and cleaner power could cut projected 2050 cooling emissions by 64 per cent, and by 97 per cent with rapid power-sector decarbonisation.

PRACTICAL HEAT MANAGEMENT LESSONS

What practical lessons can European cities draw from Singapore?

First, plan with communities, not merely for them. Heat action plans that exclude residents, workers, schools, care providers and local businesses will miss where risk actually falls.

Second, target mechanical cooling where risk is highest. Hospitals, care homes, schools, social housing, public transport and cooling shelters need safe indoor temperature standards.

Third, retrofit buildings before air-conditioning demand locks in and strains power grids. External shading, shutters, reflective roofs and cool walls, ceiling fans, cross-ventilation and night cooling can reduce indoor heat and electricity demand.

Fourth, cool streets and public spaces as well as rooms. Cities need trees, shade structures, drinking water fountains, shaded bus stops, cooler pavements and heat-safe public spaces.

Fifth, regulate cooling as part of the energy system. Efficient appliances, low-global-warming refrigerants, district cooling, demand management and clean electricity matter. Air-conditioning powered by dirty grids and leaky refrigerants may solve a climate adaptation problem while worsening the mitigation one.

Despite these lessons, there is an obvious counterargument that European cities only face

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intermittent summer extremes, and not Singapore's year-round humid heat.

Avoiding tropical levels of air-conditioning dependence is sensible. But intermittent no longer means rare. With climate change and the urban heat island effect, heat risk is becoming structural. Refusing to plan for more frequent and intense summer heat is equally unsound.

Temperate cities should not copy the tropics' bad habits, such as setting the air-con to under 23°C. Climate adaptation should not require wearing a sweater indoors. Instead, cities should treat cooling as heat-smart urban planning and public health protection.

Air-conditioning will be necessary in some places, especially for the vulnerable, but it needs sitting within a broader portfolio that keeps people safe without locking cities into wasteful dependence.

Winston Chow is Lee Kong Chian Professor of Urban Climate at Singapore Management University (SMU) and is a Co-chair of the Intergovernmental Panel on Climate Change (IPCC). The views expressed are his own and do not reflect the views of SMU or IPCC.

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