Submission No 6

INQUIRY INTO CLEAN INDOOR AIR

Organisation: Copper Tree Analytics

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From: Chris Stamatis
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I welcome the opportunity to contribute to the Inquiry into Indoor Air Quality in New South Wales.

I provide this submission in my capacity as Director of CopperTree Analytics Australia, one of Australia's largest HVAC data analytics companies, and as a Non-Executive Director of both AIRAH (the Australian Institute of Refrigeration, Air Conditioning and Heating) and ARBS Exhibitions, with responsibility for governance, industry leadership and strategic oversight. I have over 15 years' experience in the HVAC&R and built-environment industry, spanning mechanical system design, building automation and controls, and the application of digital tools to improve system performance and occupant outcomes.

My professional work centres on helping building owners, designers and operators understand how HVAC systems perform in practice, and on identifying practical ways to improve ventilation, control and operation in order to deliver healthier indoor environments while maintaining energy efficiency and supporting emissions reduction objectives.

From a building services perspective, poor indoor air quality is most commonly the result of:

- Insufficient outdoor air ventilation
- Inadequate or poorly maintained filtration
- HVAC systems operating below their design intent
- Control strategies that prioritise energy savings without regard to occupant health

These conditions increase exposure to airborne pollutants and pathogens and can contribute to reduced cognitive performance, increased absenteeism and heightened work health and safety risks, particularly during respiratory disease outbreaks or extreme air quality events.

In practice, buildings with the greatest IAQ challenges are often older facilities, public buildings and schools, where systems were designed to outdated standards and have not been upgraded. This creates inequitable health outcomes based on the quality of the building, rather than the needs of the occupants.

Practical Solutions to Improve IAQ

Building Design

For new buildings, indoor air quality should be addressed at the design stage through:

- Ventilation rates aligned with health-based guidance, not minimum compliance alone
- High-efficiency filtration appropriate to the building type and risk profile
- HVAC zoning that reflects actual occupancy patterns
- Systems designed to operate efficiently across a range of conditions

Importantly, well-designed systems can deliver higher outdoor air rates with minimal energy penalty when combined with efficient plant selection and appropriate control strategies.

Retrofitted Measures

For existing buildings, effective and low-risk improvements include:

- Upgrading air filters where systems can accommodate higher efficiency media
- Ensuring ventilation systems are capable of delivering their intended outdoor air volumes
- Recommissioning and balancing existing HVAC systems
- Implementing demand-responsive ventilation based on occupancy rather than fixed schedules

In many buildings, these measures unlock latent capacity that already exists within the system, avoiding the need for energy-intensive over-ventilation.

Energy Efficiency and Carbon Reduction

A key concern raised in discussions around indoor air quality is the perceived trade-off with energy use and emissions. In practice, poor control and poorly commissioned systems often result in both poor air quality and unnecessary energy consumption.

Strategies such as:

- Variable air volume systems
- Heat recovery
- Occupancy-based ventilation
- Optimised operating schedules

allow buildings to deliver clean indoor air only when and where it is needed, reducing both emissions and operating costs.

Recommendations

I recommend the Inquiry consider:

1. Establishing minimum, health-based indoor air quality performance expectations for public buildings
2. Requiring verification that ventilation systems operate as intended
3. Supporting cost-effective retrofits focused on ventilation, filtration and commissioning
4. Ensuring IAQ improvements are assessed alongside energy and emissions performance
5. Treating indoor air quality as a core public health and work health and safety issue

Indoor air quality is a solvable engineering challenge. The industry already has the tools and expertise to deliver healthy indoor environments without undermining energy efficiency or emissions reduction goals. Clear expectations, practical guidance and appropriate oversight will enable these outcomes to be delivered consistently and equitably across New South Wales.

Regards,

Chris Stamatis