Open Letter to the Centre for Safe Air

Re: Promotion of Ultra-Low Emission Burners (ULEBs) in The Examiner opinion piece[i] ***"Famously Smoky: Launceston Deserves Healthier Air"*** *(attached)* **re: Launceston Wood-heater Consultation - and the Future of Clean Air Policy in Australia**

Dear Prof Fay Johnston, Director at the Centre for Safe Air,

We write as part of a broad and deeply committed clean air advocacy community that has long respected your work and the Centre for Safe Air in advancing awareness of the health harms of air pollution.

It is precisely because of this respect, and our shared commitment to protecting public health, that many in our community feel compelled to express concern at the continued promotion and research focus on Ultra-Low Emission Burners (ULEBs) as a potential pathway forward for residential heating. We are concerned that this product is being promoted in Australia by the Centre for Safe Air, even though it is still in testing stage for local conditions in Australia. Of greater concern is that the public focus on a technological "fix" will extend the lifespan of residential wood smoke pollution, slowing down the transition toward zero-emission heating technologies.

At the heart of this concern is a fundamental principle that has been consistently established across decades of scientific evidence: **there is no safe level of exposure to hazardous air pollution, particularly fine and ultrafine particles.**

1. The unintended consequence of "cleaner" combustion

Emerging research is increasingly demonstrating that efforts to make solid fuel burning "cleaner" are exacerbating the most harmful component of emissions - **ultrafine particles (UFPs)**. Contrary to common expectations, it appears that **modern units may generate a higher count of UFPs**, although emitting less particulate mass than older units[ii].

A recent Irish study found that policies promoting "low smoke" fuels have resulted in **double to triple increases in ultrafine particle emissions**, with particle mass-based measurements **underestimating UFP exposure by up to a factor of ten**[iii]. What appears to be a low mass concentration translates to a high UFP count. Another study found that both "cleaner" fuels and stoves designed to reduce $PM_{2.5}$ emissions are not necessarily effective in reducing ultrafine particle emissions, and may increase them in some cases - with 90% of household combustion emissions being UFPs[iv].

This finding is critical. It challenges the very premise that combustion-based solutions can be engineered to be safe**.**

2. Indoor exposure risks remain - regardless of stove type

Further evidence shows that so-called "cleaner" stoves and fuels significantly increase indoor UFP pollution exposure.

A recent study found that residential wood burning leads to substantial increases in **UFPs, $PM_{2.5}$, black carbon and carbon monoxide indoors**, with pollutant levels rising well beyond safe limits - even in homes using cleaner appliances[v].

Notably:

- Manufactured fuels such as wood briquettes and smokeless coal increased ultrafine particle exposure by **1.5 to 1.7 times** compared to seasoned wood
- Instrumentation failure occurred in the cleanest stove category (Clear Skies Stove Level 5 - most comparable to ULEB) due to **extreme concentrations of ultrafine particles**

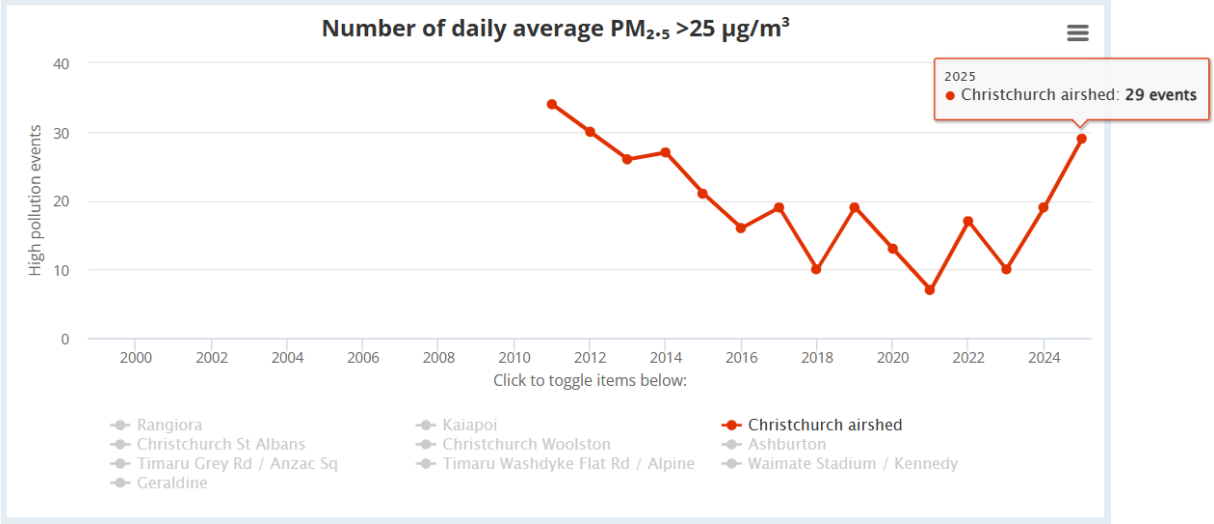
These findings again point to a consistent conclusion: **combustion is the problem - not just the technology.**

3. NZ real-world outcomes do not match narratives

The Canterbury (NZ) case is being cited by the Centre for Safe Air as a success story for transitioning to cleaner wood heating, including ULEBs. However, a closer examination of air quality monitoring data raises questions about the extent and durability of these imprrovements.

While certain reductions may have occurred, the **broader evidence does not support the conclusion that combustion-based heating solutions deliver consistently safe or acceptable air quality outcomes**, particularly when considering cumulative exposure and vulnerable populations.

- PM_{10} and **$PM_{2.5}$ exceed** the NESAQ (National Environmental Standards for Air Quality) or CARP (Canterbury Air Regional Plan) **in all Waitaha airsheds in 2024**[vi]
- Since 2020 to 2025[vii], the **2 air quality monitors in Christchurch show an upward trajectory in annual average $PM_{2.5}$ emissions**
- Comparison of the 10 monitoring locations in **Canterbury from 2020 to 2025 shows increased exceedances (> 25µg/m³) in seven of the ten locations** - **notably Christchurch airshed in 2024 had 19 exceedances, escalating to 29 events in 2025**
- **Most importantly all monitors in the Canterbury region show annual averages of $PM_{2.5}$ at or above the WHO guideline of 5µg/m³ in every year since $PM_{2.5}$ monitoring began**
- **BaP exceeded guidelines when monitored in Christchurch and Timaru**



Taken together, the **data do not demonstrate sustained or consistent improvement in air quality outcomes across Canterbury**. This calls into question whether Christchurch can be considered a reliable model for achieving clean air through improved wood heating technologies. The Canterbury experience in fact raises fundamental questions about whether combustion-based heating, regardless of technological refinement, can ever deliver safe and reliable air quality outcomes at a population level.

Real-world testing of ULEBs in New Zealand further reinforces these concerns. A 2022 in-home study[viii] in Arrowtown found that emissions from ULEBs varied significantly between households and were heavily dependent on user behaviour, fuel characteristics, and operating conditions. Importantly, real-world emission rates were substantially higher than those achieved under laboratory testing conditions used for certification.

Even the most advanced combustion technologies and testing protocols, designed to replicate real-world emissions, cannot account for **genuine real-world user behaviour** in a device that is reliant on operator compliance.

This non-compliance includes:

- Burning of inappropriate materials
- Use of accelerants and firelighters
- Poor operation and maintenance

Recent research has shown that **domestic firelighters alone can emit more black carbon than all biomass fuels combined**, even when used briefly[ix].

Black carbon is not only a major health hazard but also a powerful short-lived climate pollutant.

The most effective pathway remains clear: prioritising clean, efficient, low-cost and climate-friendly electric heating, by **not permitting the installation of new solid fuel heaters and phasing out existing ones.**

4. The economic burden of combustion remains significant - even for ULEBs

A recent New Zealand study assessing the health and economic costs of indoor air pollution found that **all combustion appliances carry significant costs**, including those promoted as cleaner alternatives[x].

- Key findings include: **ULEBs: ~$NZ5,600/year** (combined indoor + outdoor impacts)

The conclusion was clear: **regardless of assumptions, combustion appliances impose significant health and economic burdens.**

This reinforces a critical point - ULEBs may reduce some emissions, but they do not eliminate harm.

5. The risk of reinforcing a "business-as-usual" policy pathway

The continued focus on refining combustion technologies, such as ULEBs, risks reinforcing a **business-as-usual (BAU) policy pathway**, where policymakers have demonstrated a preference for incremental improvements to emissions standards as the path of least resistance, rather than transitioning to genuinely clean (electric) alternatives.

The least resistance approach has been tried for decades. As Dr Sophie Lewis notes in her report on wood heater policy in the ACT:

"There has been little demonstrable reduction in pollution and associated impacts over time"[xi]

Despite increasingly stringent emissions standards and efficiency improvements, real-world air quality outcomes have not reflected expectations, with well-documented gaps between laboratory performance and actual use, as well as the cumulative impacts of widespread appliance use.

There is a risk that continued investment in ULEB research - however well intentioned - may unintentionally:

- Signal to policymakers that combustion can be "fixed"
- Delay the transition to clean electric heating
- Divert limited policy, funding and public attention away from solutions that fully eliminate emissions

At a time when both **public health and climate science point clearly toward the need to eliminate combustion sources**, it is equally important to recognise that in the absence of clear, consistent messaging from authorities, and a unified voice from the research community, we are seeing contradictory and confusing public messaging.

Evidence indicates a continued rise in residential wood burning, alongside a proliferation of recreational outdoor burning practices, contributing to increased population exposure to woodsmoke pollution[xii]. This highlights a critical policy and communication gap: where ambiguity remains, so harmful practices persist and expand. In this context, continued focus on improving combustion technologies risks reinforcing mixed messages at precisely the moment when clarity and direction are most needed.

6. Concerns regarding research direction and potential conflicts of interest

There are also serious governance concerns associated with the current research pathway.

The Fire Centre's program to adapt Ultra-Low Emission Burners (ULEBs) to Australian hardwood conditions[xiii] risks being shaped, at least in part, by industry influence rather than independent public health priorities. While partnerships are disclosed, and it is noted that **Standards Australia requested the development of a new real-world testing protocol[xiv]**, there remains limited transparency around the extent to which industry stakeholders have influenced the research agenda.

Of particular concern is that Mr Tim Cannon[xv], a key stakeholder of the research project, is the (outgoing) Chair of Standards Australia (Solid Fuel Burning Appliances Committee CS-062) since 2015, and also the General Manager of the Australian Home Heating Association - the peak body representing the wood heater industry, and is Director of Cannon Combustion – a business servicing the solid fuel heating industry. This overlap raises legitimate questions about independence, particularly given the industry's long-standing position disputing the well-established body of evidence linking woodsmoke to significant morbidity and mortality impacts[xvi].

Industry actors are already leveraging ULEB research to promote appliance sales in Australia[xvii], despite the fact that the New Zealand models being referenced were developed for

fundamentally different softwood combustion conditions. This risks creating a false sense of safety, while entrenching combustion-based heating and delaying the transition to genuinely clean alternatives.

7. A public health and climate imperative: move beyond combustion

The evidence is clear and consistent:

- Combustion - of any kind - produces harmful health and climate pollutants
- "Cleaner" combustion technologies do not eliminate risk
- In some cases, they may worsen exposure to the most harmful pollutants
- The health and economic costs remain substantial

In this context, continuing to invest research effort and direct public narrative into improving combustion technologies risks delaying the transition to truly clean alternatives. Investing in and encouraging the uptake of ULEB heaters keeps homeowners reliant on wood-fired heating for another 15-20 years, potentially delaying the adoption of cleaner, electric alternatives like reverse-cycle air conditioning. The promotion of ULEBs can create the impression that wood smoke is no longer a major health issue, which can dilute pressure on governments to implement faster, comprehensive phase-outs of wood heaters in urban, regional and rural areas.

We believe the pathway forward must be **unequivocal**:

A transition away from all forms of combustion heating toward clean, electric solutions.

This aligns with:

- Public health evidence
- Climate science (including the role of black carbon and other Short-Lived Climate Pollutants)
- The principle of prevention rather than mitigation

It is also important to reflect on the conclusions of your own peer-reviewed research. As co-author of a recent study published in the Medical Journal of Australia, you concluded *that "the number of wood heaters should be reduced by banning new installations and phasing out existing units in urban and suburban areas."*[xviii]

In this context, the recent opinion piece in the Launceston Examiner risks giving the impression that Launceston can achieve clean air outcomes by following Christchurch's approach to improved wood heating technologies. For the reasons outlined above, this is not supported by the broader body of evidence.

It is therefore critical that residents of Launceston are provided with clear and consistent public health guidance: that clean air will be best achieved by prioritising clean, efficient, low-cost and climate-friendly electric heating, by not permitting the installation of any new solid fuel heaters and by progressively phasing out existing ones.

Request to meet

We reiterate that we recognise, and deeply value and respect the important and large body of research of Professor Johnston in highlighting the health impacts of solid fuel heating air pollution.

However, we urge careful consideration on whether continued focus on ULEBs aligns with the urgent need to protect community health and risks negative unintended consequences for clean air policy in Australia.

We would welcome the opportunity for open dialogue on this issue and for greater transparency around current research directions.

The community is looking for leadership that is clear, precautionary, and grounded in the principle that **clean air should not depend on managing pollution, but on eliminating its sources.**

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at https://www.facebook.com/groups/MyAirQualityAustralia

Sincerely,

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REFERENCES

[i] Centre for Safe Air Facebook post with The Examiner opinion piece
https://www.facebook.com/share/p/1HAmqpXrfF/

[ii] Nanoparticle emissions from residential wood combustion: A critical literature review, characterization, and recommendations
https://www.sciencedirect.com/science/article/abs/pii/S1364032119300012

[iii] Low-smoke fuels for residential heating linked to an increase in ultrafine particle emissions
https://www.nature.com/articles/s41561-026-01942-1

[iv] Significant ultrafine particle emissions from residential solid fuel combustion
https://www.sciencedirect.com/science/article/abs/pii/S0048969720305027#:~:text=However%2C%20CO%20emissions%20does%20not,pollutants%20such%20as%20the%20UFPs.

[v] Particulate matter exposure from different heating stoves and fuels in UK homes
https://www.nature.com/articles/s41598-025-05886-1

[vi] Air quality in the Waitaha Canterbury region
https://www.ecan.govt.nz/document/download?uri=5763154

[vii] Canterbury Air Quality Trends
Air quality trends | Environment Canterbury

[viii] Report on two air quality projects 2022: including in home Ultra-Low Emission Burner (ULEB) testing in Arrowtown.
https://www.orc.govt.nz/media/14410/no2-and-so2-monitoring-in-dunedin-and-uleb-testing-arrowtown-2022.pdf

[ix] Air quality - climate forcing double whammy from domestic firelighters
https://www.nature.com/articles/s41612-023-00427-x

[x] EECA (NZ): Indoor Combustion in New Zealand Homes: Health Effects and Costs
https://www.eeca.govt.nz/assets/EECA-Resources/Research-papers-guides/EIL-Indoor-Combustion-Study.pdf

[xi] ACT Office of the Commissioner for Sustainability and the Environment (2022) – Can Canberra 'Burn Right Tonight' or is there 'no safe level of air pollution'? An Investigation into wood heater policy in the ACT
https://envcomm.act.gov.au/wp-content/uploads/2022/08/OCSE-Wood-Heaters-Report-A40588031.pdf

[xii] Environment & Human Health, Inc. (EHHI) - *THE HARMFUL EFFECTS OF WOOD SMOKE AND THE GROWTH OF RECREATIONAL WOOD BURNING*
https://www.ehhi.org/woodsmoke-exposures.pdf

[xiii] Fire Centre Research Project – Tasmania Protocol for ULEBs
https://firecentre.org.au/projects/developing-the-tasmania-protocol-to-define-ultra-low-emission-burners-for-hardwood-fuel/

[xiv] Developing a real-world testing protocol for evaluating particulate and greenhouse gas emissions from Australian wood heaters
https://www.nespsustainable.edu.au/sites/default/files/documents/Research_Plan_Project_Plan_Emerging%20Priority%20Project%202024%20EP4.01-web%20version.pdf

[xv] LinkedIn Tim Cannon – GM of AHHA/Cannon Combustion/Chair Of Standards Australia Committee
https://www.linkedin.com/in/tim-cannon-52a57070/

[xvi] ABC News article: NZ 'ULEB' wood heaters emit a fraction of the pollution of standard models. Why aren't they in Australia?
https://www.abc.net.au/news/science/2025-07-31/uleb-wood-heaters-emit-less-pollution-smoke-particulate/105544358

[xvii] Industry promotion of ULEBs in Australia using ABC article on ULEB
https://pyrofires.com.au/ulebs-australia/

[xviii] Wood heater smoke and mortality in the Australian Capital Territory: a rapid health impact assessment
https://www.mja.com.au/journal/2024/220/1/wood-heater-smoke-and-mortality-australian-capital-territory-rapid-health-impact

Famously smoky: Launceston deserves healthier air

COMMENT

Fay Johnston

THERE is no reason why Launceston should not enjoy Tasmania's famously clean, healthy air throughout the year.

Yet every winter, Launceston's air is famously smoky and unhealthy.

Winter wood smoke is not a fact of life. It is a policy choice. And we do not have to look far to find cities who have taken action to protect their air and their health.

Smoke from wood heaters is the largest source of air pollution in Launceston - more than traffic, industry, or landscape fires.

When wood burns, it releases a mostly invisible cloud of microscopic particles.

Many of these are so small that they enter the bloodstream through the lungs.

Once in the body, they affect all our life-support systems: the lungs, the brain, and the heart.

The health impacts can be immediate and dramatic - such as an asthma or heart attack in people already at risk - but even worse are the ongoing, insidious effects throughout the body.

Year on year, smoke pollution contributes to higher rates of heart disease, stroke, diabetes, cancer, dementia, and lung diseases - reducing the average lifespan of people in the community.

Year on year, smoke pollution contributes to higher rates of heart disease, stroke, diabetes, cancer, dementia, and lung diseases - reducing the average lifespan of people in the community.

Everyone is affected, but those at higher risk are babies, children, pregnant people, the elderly and people with preexisting health conditions, including the one in eight Tasmanians with asthma.

Far from "coming down for air", many families have had to move house or even leave the state to protect the health of their loved ones.

While the situation is deeply unfair, the policy solutions are simple, practical and achievable.

In New Zealand, Christchurch faced the same air pollution challenge as Launceston.

Like Launceston, the city is ringed with hills that can trap smoke from thousands of wood heaters during the colder months.

The community rallied together and Canterbury Regional Council responded with a package of initiatives for healthier air.

They supported households to transition to smoke-free heating with subsidies for insulation and heat pumps and assistance for low-income households.

They introduced a well-funded outreach program to support homeowners with visibly smoking chimneys to rectify the problem.

And they introduced firm expiry dates for older wood-burning appliances and strict new emission-testing procedures and standards.

Just as we do not build polluting factories next to daycare centres, schools and aged care facilities, Canterbury introduced Clean Air Zones to protect vulnerable communities from wood heater pollution.

Reluctantly at first, the wood heater industry responded by engineering ultra-low emission burners (ULEBs) to meet the tighter standards.

ULEBs quickly became mainstream and affordable compared to the more highly polluting models that dominate the Australian market.

The results speak for themselves. Winter air across Canterbury is cleaner, pollution peaks are lower, and communities are healthier for it.

Not because people suddenly stopped loving wood fires, but because good policies are shifting the system toward cleaner, safer heating.

In 2000, Launceston introduced a Wood Heater Replacement Program which, according to my research, measurably improved air quality and reduced death rates, especially during winter. But since then, progress has stalled.

Launceston now has an opportunity to reclaim its winter air for good. The question is whether we choose the status quo, or choose a cleaner, healthier future.

Make sure your voice is heard by participating in the City of Launceston's community consultation by 12 April.

Professor Fay Johnston is a Medical Practitioner and Professor of Environmental Health at the University of Tasmania's Menzies Institute for Medical Research, and Director of the Centre for Safe Air, a Centre of Research Excellence funded by Australia's National Health and Medical Research Council.