

# Inquiry into the transition to electric vehicles

## Centre for Safe Air and Asthma Australia Joint Submission, March 2024

The Centre for Safe Air and Asthma Australia welcome the opportunity to provide a submission to the inquiry into the transition to electric vehicles by the House of Representatives Standing Committee on Climate Change, Energy, Environment and Water (the Committee). Our joint submission addresses the Terms of Reference (TOR) most relevant to our shared interest in improving population health outcomes associated with airborne hazards. We note that the TOR did not explicitly include the health or wellbeing impacts of transitioning away from internal combustion engine vehicles. We urge the Committee to actively seek input from health stakeholders to ensure the full range of impacts, including benefits to health and wellbeing, are considered in the Committee's inquiry and report.

### ABOUT THE CENTRE FOR SAFE AIR

The Centre for Safe Air is a Centre of Research Excellence funded by the National Health and Medical Research Council. The Centre brings together more than 20 researchers at the forefront of their fields, based in 13 of Australia's leading research institutions. The Centre supports multidisciplinary research across epidemiology, exposure assessment, toxicology, climate and air science, biostatistics, respiratory medicine, and health economics to pursue collaborative projects and to develop capacity. The vision of the Centre is "to achieve substantial improvements in population health, safety, and resilience in the face of existing, emerging, and escalating airborne hazards through evidence-based policy and practice interventions".

The Centre is principally focused on three areas that relate to air quality:

1. **Sources:** determining how to measure, track, predict and manage outdoor air hazards at national and regional scales.
2. **Settings:** considering the options for homes, schools or workplaces to mitigate the health burden from outdoor air hazards.
3. **Individuals:** considering the most vulnerable populations and how we can best protect them.

The Centre's major focus is to conduct research and advocate on the above issues to strive for safe air across all sectors of the community. Clean air is crucial to supporting good health.

### ABOUT ASTHMA AUSTRALIA

Asthma is a respiratory condition that affects 2.8 million Australians, with children being the most impacted. Asthma is responsible for at least one Australian death every day, making it a serious health concern. More than 30,000 people are hospitalised each year due to asthma, yet at least 80% of these hospitalisations are considered potentially avoidable.

Despite the prevalence of asthma, it is often misunderstood, causing fear and anxiety for those living with the condition. Asthma Australia has been the leading charity for people with asthma and their communities for over 60 years.

The challenges of climate change, unhealthy air, and health inequity make it more important than ever for people with asthma to have a voice. We search for new and progressive approaches to challenge the status quo. Our work is grounded in evidence and centred on the experiences of people affected by asthma. We believe by listening to those living with asthma, designing solutions with them, and influencing change, people with asthma can live freely, unrestricted by their asthma.

## **TOR: The impact of moving from internal combustion engine vehicles, including fuel excise loss, existing auto industry component manufacturers and the environment.**

Combustion engine vehicles are a major source of air pollution in Australia linked to significant health impacts and costs. Traffic-related air pollutants (TRAP), such as particulate matter (including ultrafine particles [UFP] and black carbon [soot]) and gases (for example, ground-level nitrogen dioxide [NO<sub>2</sub>], nitrogen oxides [NO<sub>x</sub>]), are produced by fuel combustion, tailpipe emissions, wearing of vehicle tyres and brakes, and dust production. Exposure to these pollutants can adversely impact birth weight of babies<sup>1</sup>, respiratory health (asthma and acute respiratory infections)<sup>1-4</sup>, cardiometabolic health (ischaemic heart disease, stroke, diabetes)<sup>1,5</sup>, and cognitive (brain) health<sup>6-8</sup>, leading to increased premature non-accidental deaths<sup>1,9-11</sup>.

The evidence for adverse effects associated with nitrogen dioxide, a pollutant highly characteristic of TRAP, has strengthened in the last decade, with individual studies<sup>12-14</sup>, and meta-analyses reporting increased risks of premature death<sup>15,16</sup>. Further, impact assessments have estimated that 33% of incident childhood asthma cases in Europe<sup>17</sup> and 17.6% in the US might be attributable to traffic emitted NO<sub>2</sub><sup>18</sup>. The evidence for adverse effects of both short and long-term exposure to traffic emitted black carbon include an increased risk of cardiovascular disease<sup>19</sup> and death<sup>20</sup>. In 2018, an estimated A\$910M economic cost of mortality and morbidity was related to TRAP in Australia, with New South Wales and Victoria each exceeding A\$300M<sup>21</sup>.

Fuel combustion also produces greenhouse gases (such as carbon dioxide [CO<sub>2</sub>]) that contribute to climate change<sup>22</sup>. Internal combustion engines cause indirect health damage in Australia through climate change impacts including higher ambient temperatures and more frequent heatwaves, more frequent, severe and prolonged bushfires<sup>23</sup>, more frequent droughts and floods, more allergic pollen and increased risk of thunderstorm asthma events<sup>24-28</sup>. As greenhouse gases and air pollutants stem from the same sources of fuel combustion, reducing fossil fuel and biofuel burning will achieve multiple improvements in public health<sup>29</sup>. These inter-relationships are illustrated in Figure 1.

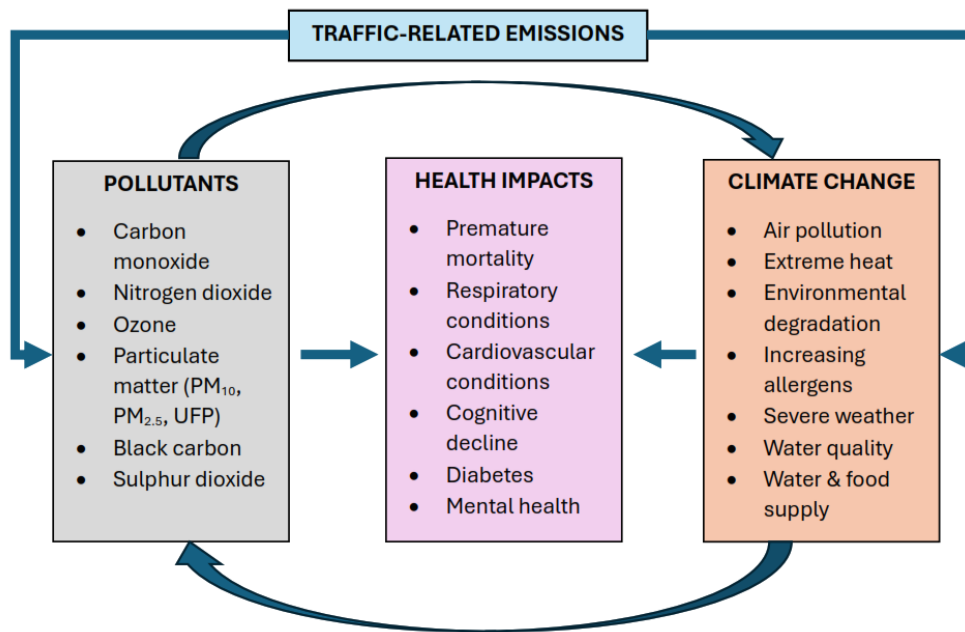


Figure 1: The inter-relationships between traffic-related emissions, air pollutants, climate change impacts and health impacts. (Figure adapted from Keswani et al, NEJM 2022)

TRAP disproportionately impacts communities living in lower socio-economic areas which typically have a greater density of roads, especially major roads that carry high traffic volumes and heavy vehicles, and industries, compared with higher socioeconomic areas<sup>30,31</sup>. This increased exposure to TRAP results in inequitable health impacts<sup>32</sup>.

Electric vehicles are an important component of the transition away from internal combustion engines<sup>33</sup>. This transition is urgently needed to improve air quality, reduce carbon emissions, and prevent further health damage from TRAP and climate change<sup>33</sup>. In 2020, it was estimated that there were more than 16.5 million electric vehicles in service globally<sup>34</sup>, with electric vehicles representing almost 10% of new car sales<sup>34,35</sup>. According to the Electric Vehicle Council (Australia), during the first half of 2023, 8.4% of new cars sold in Australia were electric vehicles of which passenger vehicles were the predominant form<sup>36</sup>. This was a 120% increase from 3.8% in 2022<sup>36</sup>, which reflects the increase in consumer demand for electric vehicles. Notably, electrification of heavy vehicles significantly reduces nitrogen dioxide and may also reduce concentrations of black carbon and particulate matter<sup>37</sup>. The greatest health benefits are likely to be experienced by not only the most disadvantaged communities, but also people living close to main roads and in areas with the highest levels of TRAP<sup>38</sup>.

Maximising the health and environmental benefits of a transition to electric vehicles will require the use of low or non-carbon renewable energy sources to power electric vehicles<sup>39</sup>. Relying on conventional fossil fuel combustion, e.g. from coal-fired power stations, will maintain or even increase the inequitable distribution of health impacts, as people living close to coal fired power stations continue to be exposed to elevated air pollution, while those who are only exposed to vehicle emissions benefit from reduced air pollution<sup>40,41</sup>. The location and sources of electricity production must be considered in the transition to electric vehicles to ensure health improvements are distributed equitably.

**Recommendation 1: The Committee should consider the health impacts of a transition to electric vehicles, including the potential to improve or deepen health inequities. Additionally, the Committee should actively seek input from health stakeholders to ensure it considers the full range of potential health benefits and harms.**

**Recommendation 2: The Committee should consider the disproportionate impacts of air pollution from internal combustion engines, as well as fossil fuel power generation, on specific populations such as people in lower socioeconomic areas.**

**Recommendation 3: The Committee should consider the location and sources of electricity used to power electric vehicles to ensure equity in the distribution of health benefits resulting from the transition to electric vehicles.**

### **TOR: Any other relevant matters.**

Transitioning to electric vehicles is only one component of reducing TRAP and building sustainable transportation. Although tailpipe emissions from fossil-fuelled internal combustion engines will be reduced among electric vehicles, other emissions such as particulate matter from tyre and brake wear and roadway dust dispersion remain<sup>33,42</sup>, and these still have the potential to impact on respiratory, cardiovascular, and cognitive health<sup>43</sup>. Addressing these challenges will be crucial for maximising the air quality and health benefits of an electric vehicle transition.

Building sustainable transportation systems requires creating efficient, low-emission travel options that reduce air pollution and support healthier environments. Transitioning from passenger vehicles to active transport (e.g. walking and cycling) and public transport, and reducing the numbers of vehicles on the road, have been shown to improve health outcomes. The changes in reduced air pollution, increased physical activity, reduced environmental noise, and low emission travel result in improved cardiovascular, respiratory, musculoskeletal, diabetic and cognitive health outcomes<sup>44-46</sup>. However, promoting and sustaining active and public transport requires prioritisation and investment.

**Recommendation 4: The Committee should recognise that additional policy reforms to reduce reliance on passenger vehicle use would enhance the health and wellbeing benefits of an electric vehicle transition, such as investing in active and public transport.**

**Recommendation 5: The Committee should consider multiple types of electric vehicles and electric transport infrastructures to minimise congestion and maximise the social and economic benefits of the transition.**

### **Contact people**

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