T R A N S C R I P T

LEGISLATIVE COUNCIL ENVIRONMENT AND PLANNING COMMITTEE

Inquiry into the Health Impacts of Air Pollution in Victoria

Melbourne—Tuesday, 10 August 2021

MEMBERS

Ms Sonja Terpstra—Chair
Mr Clifford Hayes—Deputy Chair
Dr Matthew Bach
Ms Melina Bath
Dr Catherine Cumming
Mr Stuart Grimley
Mr Andy Meddick
Mr Cesar Melhem
Dr Samantha Ratnam
Ms Nina Taylor

PARTICIPATING MEMBERS

Ms Georgie Crozier
Mr David Davis
Dr Tien Kieu
Mrs Beverley McArthur
Mr Tim Quilty

WITNESSES *(via videoconference)*

Ms Carolyn Jackson, Acting Deputy Secretary, Environment and Climate Change, and

Mr Hamish Webb, Director, Knowledge, Planning and Risk, Forest, Fire and Regions, Department of Environment, Land, Water and Planning;

Mr Lee Miezis, Chief Executive Officer,

Professor Mark Taylor, Chief Environmental Scientist,

Dr Martine Dennekamp, Senior Environmental Epidemiologist, and

Dr Paul Torre, Senior Applied Scientist, Environment Protection Authority; and

Professor Brett Sutton, Chief Health Officer, Department of Health.

The CHAIR: I declare open the Legislative Council Environment and Planning Committee's public hearing for the Inquiry into the Health Impacts of Air Pollution in Victoria. Please ensure that mobile phones have been switched to silent and that background noise is minimised.

I would like to begin this hearing by respectfully acknowledging the Aboriginal peoples, the traditional custodians of the various lands we have gathered on today, and pay my respects to their ancestors, elders and families. I particularly welcome any elders or community members who are here today to impart their knowledge of this issue to the committee or who are watching the broadcast of these proceedings. I would like to welcome any members of the public who may be watching these proceedings via the live broadcast as well.

I take the opportunity now to introduce the committee members to you. My name is Sonja Terpstra. I am the Chair of the Environment and Planning Committee. Also appearing via Zoom I have Dr Samantha Ratnam; Ms Melina Bath—she will be joining us momentarily; Mr Andy Meddick; Dr Matthew Bach; Mr Cesar Melhem; Mrs Bev McArthur; and Ms Nina Taylor. I hope I did not miss anyone.

All evidence taken today is protected by parliamentary privilege as provided by the *Constitution Act 1975* and further subject to the provisions of the Legislative Council standing orders. Therefore the information you provide during the hearing is protected by law. You are protected against any actions for what you say during this hearing, but if you go elsewhere and repeat the same things, those comments may not be protected by this privilege. Any deliberately false evidence or misleading of the committee may be considered a contempt of Parliament.

All evidence is being recorded. You will be provided with a proof version of the transcript following the hearing. Transcripts will ultimately be made public and posted on the committee's website.

Before we begin, if I could just get you all for the Hansard record—but of course one of at a time—to state your name and the organisation you are appearing on behalf of. So perhaps, Professor Sutton, if we start with you.

Prof. SUTTON: Brett Sutton, Chief Health Officer, Department of Health, Victoria.

The CHAIR: Thank you. Ms Jackson?

Ms JACKSON: Carolyn Jackson, Acting Deputy Secretary, Environment and Climate Change group, with the Department of Environment, Land, Water and Planning.

The CHAIR: Mr Taylor?

Prof. TAYLOR: Mark Patrick Taylor, EPA Victoria, Chief Environmental Scientist.

The CHAIR: Thank you. Mr Miezis?

Mr MIEZIS: Lee Miezis, Chief Executive Officer of the Environment Protection Authority Victoria.

The CHAIR: Mr Webb?

Mr WEBB: Hamish Webb, Department of Environment, Land, Water and Planning.

The CHAIR: And Dr Dennekamp.

Dr DENNEKAMP: Hi—Martine Dennekamp, EPA Victoria, Senior Epidemiologist.

The CHAIR: Thank you. Now, I think that is everyone. With that, we will get underway. As I said earlier—

Dr TORRE: Sorry, there is also me. It is Dr Paul Torre from EPA Victoria. I am a Senior Applied Scientist for air and odour.

The CHAIR: Thanks so much for that. I apologise for missing you there. I have only got so many screen tiles up there. With that, I will hand over now to the panel for you to give your opening statement. So I do not mind who wants to start, really. I have got on my list who will talk first, but I do not mind.

Ms JACKSON: Chair, it will be DELWP if that is okay.

The CHAIR: Sure, no worries. Okay, thank you. We will hand over to you.

Visual presentation.

Ms JACKSON: As previously, my name is Carolyn Jackson. I am the Acting Deputy Secretary for the Environment and Climate Change group within the Department of Environment, Land, Water and Planning. John Bradley, the Secretary of DELWP, has asked me to appear on behalf of the department and to thank the committee for the invitation to appear today.

Before we start I do want to acknowledge the traditional owners of the various lands on which we are meeting and pay my respects to their elders past, present and emerging.

I am accompanied today by Hamish Webb, who is the Director of Knowledge, Planning and Risk in our Forest, Fire and Regions group, and he will be able to provide advice to the committee in relation to smoke from bushfires and planned burning if the committee does have any particular questions on that particular issue.

DELWP's responsibilities straddle more than just the environment, climate change and fire portfolios that Hamish and I represent. They extend to energy and planning portfolios amongst others. And if the committee has any questions on these other areas that we are unable to answer today, we are of course happy to take questions on notice and respond as quickly as we can.

DELWP leads policy and legislative reform for environment protection, pollution and waste. DELWP incorporates significant input from EPA into those tasks, drawing on its operational, scientific and regulatory expertise. DELWP also works across government with other departments, such as the departments of health and transport, on policy and strategy for air quality. A good recent example of how DELWP works with other agencies on air quality issues is in connection with the work on the Inner West Air Quality Community Reference Group, who I understand you have heard from during these hearings. This work involved multi-agency cooperation to engage with the CRG, analyse its advice and identify options for action to improve air quality.

By world standards air quality in Victoria is generally good. I understand my colleagues from the EPA will discuss Victoria's air quality in more detail. Improvements have come about due to a variety of interventions, illustrating how diverse the action to improve air quality needs to be. EPA regulation of major industries, such as through licensing and works approval, has reduced emission of air pollutants significantly. Large reductions in motor vehicle emissions have been achieved through technological advances, and perhaps the best example of this is the introduction of unleaded petrol for light vehicles in the 1980s. And once common practices, such as open burning by households of autumn leaves, have been controlled by local laws, which in turn were supported by the introduction of alternative ways of managing waste, such as kerbside recycling.

However, there is work to be done to secure a clean-air future. I have set out some of the key pressures on this slide. The committee will have received evidence in submissions and from witness testimony about these

issues, so I will not go over them in detail in the interests of time but will note that the diversity of pressures reiterates the importance of coordinated action by government across multiple areas to control air pollution and reduce the impact on the health of Victorians.

Strategic work to improve air quality is led by the environment portfolio but incorporates the efforts of other portfolios, including climate change, energy, transport and planning. A key recent environment portfolio reform to improve air quality is Victoria's new *Environment Protection Act*, which commenced on 1 July. The new Act represents a generational change to how the risk of harm to human health and the environment from pollution and waste will be managed in Victoria. The emphasis shifts from tackling pollution after it happens to preventing it from happening in the first place. The centrepiece of the new framework is the general environmental duty, which is supported by other duties, a new permissions framework and higher penalties. My colleagues from the EPA can speak to these reforms in more detail.

Any work to reduce greenhouse gas emissions by reducing the use of fossil fuels for energy and transport will also reduce emissions of air pollutants. Through the *Climate Change Act* and Victoria's climate change strategy, Victoria has a comprehensive framework for tackling climate change that reduces emissions of air pollutants as well as greenhouse gases.

Work to improve air quality is occurring in other parts of government in addition to those directly concerned with the environment. I have highlighted a few of the many initiatives in the energy and transport portfolios to illustrate how work in such diverse areas as energy security, public safety, electrification of transport and congestion relief can yield co-benefits for air quality. Victoria is shifting to a clean and efficient energy future. Any initiatives that shift us away from fossil fuels will have corresponding benefits for reducing air pollution. Government investment, such as the $335 million to support low-income and vulnerable households to replace old, inefficient and high-emission heaters with high-efficiency reverse-cycle air conditioners, can have a number of benefits, including addressing smoke from wood heaters. We continue to explore opportunities to reduce emissions of air pollutants from a variety of sources with our colleagues across government.

DELWP has many responsibilities with implications for air quality. One important area is the management of fire in the landscape, which can have major smoke impacts. South-eastern Australia, including Victoria, is recognised as one of the most bushfire prone areas in the world. Bushfires are part of our lives and natural environments. Unfortunately at times these fires have had catastrophic consequences on communities and natural environments. This includes the impact and consequence of smoke, which can impact communities a long way from the fire front. Victoria's risk-based approach to managing bushfire risk is designed to consider the risk and consequence of bushfires and the most effective way to reduce these risks. DELWP's fuel management program, including planned burning, is a key pillar of this approach. DELWP considers the relative effectiveness and impact of fuel management activities such as the impact of smoke from planned burning compared to the risk and impact of bushfires on the same values. DELWP works closely with communities, industries and partners to minimise the impact of fuel management, including smoke, during the scheduling and delivery of planned burns. As I mentioned, my colleague Hamish Webb will address any questions on this topic that you may have.

In terms of integrated work at the local level, I would like to highlight again the great work of the Inner West Air Quality Community Reference Group. Working with the CRG was a multi-agency effort that included contributions from DELWP, EPA, the Department of Transport and the Department of Health. Government has committed to a variety of actions, including establishing a low-emission initiatives priority zone in the inner west—a Victorian first which will see the area prioritise clean energy technology trials over the next two years. The inner west suburbs and routes will be prioritised for the initial rollout of clean transport initiatives such as those included in the zero emissions bus program, and $5 million is being provided to plant 500 000 new trees in growth areas across six local government areas, providing more shade and green spaces, driving down pollution and improving air quality. The government has written to the chair of the CRG to outline all of these commitments.

To summarise, Victoria's air quality has improved over time and we regularly comply with national air quality standards, but we also know some communities in the state still experience poor air quality due to significant local influences. The new *Environment Protection Act* provides a statutory framework that is better suited to the more localised and dispersed challenges of the future. DELWP will continue to work across government and with local government, industry and the community to secure a clean energy future for Victoria. The

government is committed to releasing an air quality strategy for Victoria. I would like to now hand over to my colleagues in the EPA, and I think that is Lee in the first instance. Thank you.

Mr MIEZIS: Thank you, Carolyn, and thank you, Chair. I will just share my screen and then go through a short opening statement.

Visual presentation.

Mr MIEZIS: Hopefully that has worked. Great. Thank you. The Environment Protection Authority was established in 1971 under the *Environment Protection Act 1970*, and we are the principal Victorian government agency responsible for the regulation, monitoring and assessment of air pollution in Victoria. We have an ongoing commitment to the community to report air quality across the state. EPA regulates air pollution under the *Environment Protection Act 2017*, which replaced the 1970 Act on 1 July this year, so some 40 days ago. While EPA is the regulator, as Carolyn has just talked through, DELWP has primary responsibility for advising government on air quality policy and legislation, so the laws that EPA regulates against. To influence better air quality outcomes EPA works with DELWP and across government, including with the commonwealth, other state and territory governments and local government. We are certainly as an organisation committed to improving Victoria's air quality and empowering individuals with information to assist in minimising their exposure to and managing health effects from air pollution.

As I mentioned, the new *Environment Protection Act* came into effect on 1 July, and the new Act transforms both environment protection in Victoria and the EPA as we seek to become a modern and world-class regulator. The new Act fundamentally changes our approach to harms caused by pollution and waste, shifting the focus from managing impacts on communities and the environment after they have occurred to preventing impacts from occurring in the first place. And the cornerstone of the new legislation is the general environmental duty. A world first, the GED applies to all Victorians, not just industry, and requires people to undertake reasonably practicable steps to eliminate or otherwise reduce risks to human health and the environment from pollution and waste. The GED provides a significant shift in the way air quality will be managed in Victoria. It will require duty holders to take proactive steps to assess the risks posed by emissions from their activities and to implement actions to minimise those risks. The Act also includes a tiered system of EPA permissions to support risk-based and proportionate regulatory oversight, it makes significant reforms to contaminated land and waste management and it modernises and strengthens EPA's compliance and enforcement powers.

Turning now to air pollution in Victoria, an air pollutant is any substance that can harm humans, animals, vegetation or other parts of the environment if it is present in the air in sufficiently high concentrations for specific periods of time. Air pollution comes from a range of natural and anthropogenic sources. In Victoria natural sources of pollution include windblown dust, sea salt and bushfires. Anthropogenic sources include major industries, commercial activities, motor vehicles and wood burning, and in Victoria particulate matter, so PM10 and PM2.5, and ozone are the pollutants of greatest concern due to the frequency of their occurrence, the concentrations that they can sometimes reach in ambient air and their potential for health and environmental impacts.

Now, some of the key challenges that we see in relation to air quality in Victoria include demographic change. Victoria's population is growing and ageing, so by 2056 the Victorian population is expected to increase to over 11 million and the number of people who are over 60, so those who are more vulnerable to air pollution, is expected to more than double. We are also seeing increasing urbanisation in Victoria, so by 2056 it is expected that 80 per cent of Victorians will be living in Melbourne where, without action, they will be more exposed to greater levels of industrial, vehicle and smoke pollution compared to today. In addition we also expect that there will be an extra 10.4 million trips a day across Melbourne by 2050. As has been touched on by Carolyn, a warming and a drying climate is another air quality challenge, and by 2050, again, if current rates of global warming continue, Victorian towns can expect around double the number of very hot days each year compared to the period of 1986 to 2005, again further increasing those pollution risks from bushfires and raised dust levels.

EPA undertakes air quality monitoring to measure and assess the impacts of air pollutants on human health and the environment, and we commenced daily air quality monitoring in 1979. And through our air monitoring network, which includes 24 fixed ambient air quality sites in metropolitan and regional locations and 60 air

quality sensors that are widely distributed across Victoria, EPA currently monitors air quality to inform both reporting and forecasting.

We monitor and report against national and state air quality standards, which include the National Environment Protection (Ambient Air Quality) Measure and the new Victorian environment reference standard. We currently monitor particulate matter—so PM2.5 and PM10—nitrogen dioxide, carbon monoxide, ozone and sulphur dioxide, and the information is reported publicly via our AirWatch website, which I will touch on shortly, but it is also included in various reports and on the data.vic.gov.au website.

Now, monitoring provides information on the concentration of pollutants in the air, which then enables assessment of air quality relative to objectives; it informs the development of air quality management strategies; and it allows evaluation of the effectiveness of air quality management activities. And EPA is continually working to update its air monitoring network and improve all of its monitoring across all environmental segments, which include air.

As I said, air quality data from our air monitoring network is made publicly available by EPA's AirWatch website, which is really there to assist Victorians to understand air quality and to receive health messages for their area. An enhanced EPA AirWatch was launched in November 2019, and it provides an interactive map, graphs and a table showing air quality information measured at stations around Victoria, with location data updated each hour. Trends for the last 48 hours are also displayed to allow members of the public to see how air pollution may be changing in their local area. And to give an example, at the height of the 2019–20 bushfires, EPA's AirWatch website traffic grew from an average of 3200 daily users to 14 200 and it was viewed around 3.9 million times during the summer.

In terms of Victoria's air quality, the most recent National Environment Protection Council annual report found Victoria's air quality in 2019 was generally considered to be good, although there were periods of poor air quality due mostly to bushfire smoke and urban pollution. Urban pollution is a combination of common anthropogenic sources, such as industry; commercial businesses, such as restaurants; motor vehicles; and domestic fuel heaters. In 2019 two major bushfires in eastern Victoria were the main source of high levels of PM2.5 and ozone, which resulted in periods of poor air quality, and for PM10 there was an increase in the number of exceedences measured at many air monitoring stations. And while some of those exceedences were due to bushfires, the majority were from windblown dust, most likely related to lower than average rainfall. If we look at exceedences of air quality in standards in 2020, there were no exceedences for carbon monoxide, nitrogen dioxide or sulphur dioxide, and there were some exceedences of fine particles and ozone, again as a result of bushfires and other smoke events, largely.

When looking at the longer term trends, in 2018 EPA found that since 2009 there had been a reduction in the number of days when PM2.5 had exceeded national standards. After variable results in previous years, in 2017 Victoria experienced a noted increase in the number of days where the daily PM2.5 standard was exceeded, with most exceedences attributed to urban sources such as wood heaters. And despite an increase in annual average ozone concentrations in Melbourne from 1979 through to 2017, there has been a general decrease over time in the maximum peak 1-hour concentrations of ozone measured in Melbourne, and concentrations of carbon monoxide, nitrogen dioxide and sulphur dioxide were all at levels well below the national standard. EPA's next report against the National Environment Protection (Ambient Air Quality) Measure will be published later this year, and that will include data on the 2020 summer bushfires.

If I move quickly through this slide, there is now strong evidence that air pollution is associated with adverse health effects even at concentrations below the current air quality standards. Those predominant health impacts are premature mortality and effects on the respiratory and cardiovascular system. In 2013 the International Agency for Research on Cancer classified outdoor air pollution and particulate matter as carcinogenic to humans. Particulate matter is estimated to be the individual pollutant responsible for the largest burden of disease from outdoor air pollution. This is mainly due to its effects on the cardiovascular and respiratory system, as the small particles can penetrate deep into the lung. Air pollution can also affect the natural environment and can also have significant impacts on local amenity, so reducing people's desire to engage in outdoor and community activities.

Over recent years, in addition to our regulatory actions, EPA has undertaken significant work to enhance air quality, which includes leading the review of ozone, nitrogen dioxide and sulphur dioxide standards in the

National Environment Protection (Ambient Air Quality) Measure to bring those standards in line with recent health evidence. We have led extensive interjurisdictional collaboration on behalf of enHealth to develop a 1-hour and 24-hour PM2.5 framework and associated messaging, and we have led the development of new draft air pollution guidance to support businesses to understand, assess and minimise the risk from air emissions.

And finally, EPA contributes to a number of projects to better understand and work to reduce air pollution and minimise health impacts, and some of our recent collaborations have included, as Carolyn talked to, working with the Inner West Air Quality Community Reference Group and the Brooklyn community reference group. We have continued research and development, including working with the Australian Catholic University on indoor portable air cleaners. We have got three new citizen science air quality monitoring projects in Melbourne's inner west, in Bendigo and in the Yarra Ranges, and we are continuing to support emergency services through delivery of our incident, air and environmental air monitoring capability and the deployment to emergency events.

I might stop there, and I will hand over to Brett Sutton.

The CHAIR: Professor Sutton, are you there?

Prof. SUTTON: Just working on sharing now.

The CHAIR: Right. Thanks. And also, just joining us now is Dr Cumming as well, just to let everyone know.

Visual presentation.

Prof. SUTTON: Great. Thank you, Lee. Thank you, Chair and members. I would like to begin by acknowledging the traditional owners of the land on which I am seated and pay my respects to elders past, present and emerging.

I really want to speak about my role and its interaction with other legislative and agency responsibilities. As you would be aware, through COVID-19 I have got a specific statutory and expert role with respect to public health that includes addressing the health consequences of emergencies, both human disease epidemics but also food and drinking water and incidents involving radiological and biological releases. My appointment is a statutory appointment by the Secretary under the *Public Health and Wellbeing Act 2008*. It includes protecting public health and preventing disease, illness and injury, promoting conditions in which people can be healthy and reducing inequalities in the state of health and wellbeing. There is a role of provision of expert advice on matters relating to health and wellbeing of Victorians and also the oversight of other acts related to that—radiation safety, drinking water and food, for example.

There are obviously legislative instruments that are also involved in the protection of health and safety of Victorians, so beyond the *Public Health and Wellbeing Act*, the EPA Act and the occ. health and safety Act 2004 in addition. So in effect the Chief Health Officer engages with other agencies, including EPA Victoria, WorkSafe, local government and emergency management agencies such as EMV but also DELWP, Department of Jobs, Precincts and Regions, Consumer Affairs and Energy Safe Victoria. Where there is specific legislation, it does take precedence over the more general powers of the *Public Health and Wellbeing Act*. But the powers of the *Public Health and Wellbeing Act* really do allow for agility and flexibility, especially in response to emergent threats or incidents and emergencies.

Following the independent inquiry into the EPA in 2016, the environmental public health unit was established within the EPA. There were some staff with public health expertise within my team who were transferred to the EPA in December 2016. EPA has obviously been the lead agency for past, present and potential or future public health impacts of pollution and waste. So essentially, in terms of air quality impacts on public health, the public health team and I have a supportive and collaborative role, especially with the EPA. In addition to that, I sit on AHPPC with the chief health officers across Australia, and the deputy chief health officer for environment in my team also has a role in enHealth, the Environmental Health Standing Committee of AHPPC. The Chief Environmental Scientist—and he will introduce himself—also is on this committee as a representative of the multijurisdictional heads of EPA. EnHealth is continuing to work on guidance for public health agencies, especially for prolonged smoke events. We provide public health input to state and national

policies relating to air quality, and Department of Health in particular supports EPA on public health risk communication. So when there are prolonged smoke events, either from a fire or from bushfire or other air quality events, then with the Chief Environmental Scientist there is communication to the general public about both the nature of the risk but also how to best protect themselves and what the implications are for those particular hazards, and I can support the EPA in those health protection measures.

The global health impacts of air pollution are really well known and very substantial. There are approximately 4.1 million premature deaths globally each year or 7.5 per cent of the total of global deaths from ambient particulate matter, so a very substantial global challenge. And a recent study by Hannigan and others—and the EPA was involved in this—has estimated 650 annual premature deaths in Victoria are attributable to anthropogenic PM2.5 pollution. It is worth noting that any reduction in air pollution is beneficial to health, so there is an ongoing health benefit in every reduction in air pollution, in particulate matter.

As mentioned by DELWP and EPA, by world standards Victoria's air quality is generally good. There are areas in Victoria that have poorer air quality, such as the inner west of Melbourne, and of course there are health impacts that can occur, in particular for sensitive individuals—young children, the elderly, those with existing heart or lung disease. Asthma is obviously a very common chronic condition, especially in Australians.

I am pleased to say the state government has allocated $1.8 million over the next two years for the Department of Health to work with health providers to improve early diagnosis and management of childhood asthma in Melbourne's inner west, so in that intersection of both reduction of risk or hazard but also the awareness of pre-existing conditions so that people can take appropriate and focused preventive health actions.

Topically, with the IPCC report out this week, climate change is a very substantial risk to health and wellbeing but also has a very strong interplay with air quality, obviously with the bushfire seasons being more frequent and of longer duration, at least in modelling. In addition, as Mr Miezis has pointed out, the impact of drier conditions in some seasons, with dust being a contributor to particulate matter, is another significant challenge. The department has raised the profile of climate change and its impact on health and wellbeing for Victorians in the public health and wellbeing plan for the years 2019 to 2023 and also in my biennial report on the state of health and wellbeing for Victorians. The 2019–20 bushfire season in particular was very challenging. Hospital admissions for asthma increased by 72 and 46 per cent respectively in January 2020 compared to January 2019.

We have worked on guidance for local government in tackling climate change and its impacts on health through municipal public health and wellbeing planning, and we are very cognisant of the health co-benefits that can be obtained with increased use of public transport and with increased use of walking and cycling, which both reduce CO_2-equivalent carbon outputs but also impact on particulate matter generation. There is also guidance for local government, supporting people when air quality is heavily impacted by bushfire smoke, that has really arisen out of those 2019–20 bushfires, that supports local councils to create cooler and cleaner air spaces for individuals to get respite during some of those heavily impacted times with bushfire smoke in particular. That is it in conclusion from me. Thank you.

The CHAIR: Great. Well, thank you all very much for those opening remarks. It is a fantastic and very detailed presentation. So I will now throw to members for questions. There are actually a lot of us on this call, so I will just remind members to try and keep their preamble short to ensure that each of us has plenty of time to ask the questions. Of course if we do run out of time for questions, we can submit them on notice to the witnesses through the secretariat through the usual process. All right. I will throw to Mr Meddick first.

Mr MEDDICK: Thank you, Chair. And thank you all for presenting today. Thanks so much. I have got basically a two-pronged question, I guess, but they link in together. Look, I am curious to know the suburbs, particularly around the inner west area but I suspect that they will be moving out to outer west, such as Broadmeadows—industrialised suburbs really—which have the highest concentrations of the chemicals that we are talking about with these contaminants in the air from industrialisation, such as sulphur dioxide, carbon monoxide et cetera. We do know the health effects of these individually on people and what they can cause—asthma and stroke and those sorts of things. I am interested if there are any studies into the prolonged exposure to the combinations of all of these chemicals together in the bloodstream and how they are stored in the body and then what the combinations of those chemicals are doing for long-term health of people who are exposed from early age right through to, say, 60s or 70s—if there is any increase in those severe health conditions that are noted through autopsy or anything else as a reason for premature death.

Ms JACKSON: Thanks, Mr Meddick. I might pass that question on to Lee Miezis from the EPA, please.

Mr MIEZIS: Thanks, Carolyn. Given the nature of the question, I might ask Dr Torre to talk more generally and then perhaps Dr Dennekamp to talk particularly to health impacts.

Dr TORRE: Yes. Good morning. Thank you. In terms of air pollution and its distribution, it is very much directed on where the activity is. We do not really have concentrations around those northern—Broadmeadows—areas. But we do sort of extrapolate from monitoring that was done there in terms of incidents and also the monitoring stations around the north-west. So we tend to use Footscray and other monitoring stations to give us a surrogate for those concentrations. I think what we are finding is a lot of those concentrations are very much dependent on how close they are to that industrial activity. We are hopefully in the future doing some more modelling to get a better understanding of those exposures and the concentrations across a greater area of the metropolitan area, so that is a bit of work that will be undertaken in the future.

Dr DENNEKAMP: Thanks for your question. In terms of health impacts, we tried to put some detailed information in our submission around this. It is PM2.5 that is responsible for by far the greatest burden on health of the Victorian population. This is not just in Victoria, this is globally as well. So there is a difference between acute exposure, so shorter term exposure, and longer term exposure. Short-term exposure is really associated with specifically exacerbation of existing disease like respiratory disease—so, you know, breathing problems, asthma attacks—but also cardiovascular disease. Even studies in Melbourne have shown that there was an increase in out-of-hospital cardiac arrests with daily variation in particulate matter concentrations, PM2.5. Now, when we talk about long-term exposure, you also have those short-term exposures of course and those short-term effects, but also it has been associated with the progression of disease, so a progression of respiratory and cardiovascular disease in particular, and more recently with the development of disease as well. I am not sure how much else you would like me to talk to you about that.

Mr MEDDICK: Look, really it is more that I was looking for if there was any information on the incidence. Some of these chemicals have the capacity to be stored in the body over a period of time, and having worked in confined spaces—I have got a high accreditation for confined space on mine sites, for instance—I know the difference between, say, incidents, so individual exposure incidents, and long-term exposures. I know what the difference is between them and the health effects that can be caused in an immediate exposure that is high concentration, for instance, versus a low-concentration exposure over a period of time. I am interested in the numbers in the people we talked about in the presentation, for instance, of cancers, of strokes et cetera, et cetera. What is the incidence—the numbers of people—where the combinations of these chemicals that are in the air were found to be prevalent in the blood streams or stored in tissue of those people that have died from those incidences, where an autopsy has been performed and they have been determined as contributable to the death?

Dr DENNEKAMP: Yes, I do not have that information about what would be found in the bloods. I can talk to you in terms of the epidemiological evidence in the population level studies, because that is what the EPA is concerned with, yes. I do not have information on autopsy results, no.

Mr MEDDICK: Chair, just by way of explanation, that was just merely that I am looking to establish, like, long-term risk for particular populations so that we can perhaps aim populations where they are not going to be in an exposure area, sort of thing. That is really where I was leading.

The CHAIR: Absolutely.

Dr DENNEKAMP: Yes.

The CHAIR: All right. Thank you. Ms Taylor.

Ms TAYLOR: Thank you. Thanks for all your presentations. Apologies for my croaky voice, but I have had my COVID test, so we are good.

The CHAIR: A few of us have had a COVID test. It seems like there was something happening at Parliament last week, but anyway.

Ms TAYLOR: I know. Never mind. Now, I think it was Carolyn who mentioned our government having a commitment to an air quality strategy, and I think it was meant to be in 2019 that that was meant to be released. So I think it would be helpful for all the committee to understand why it has not been released yet and when it will be released. And maybe I will add a 'thirdly' in there and do it all in one hit: will there be a draft? I assume there will, but we are looking for this.

Ms JACKSON: Thank you, Ms Taylor, for the question. So in terms of the air quality strategy, you are correct that there was a commitment to releasing a strategy in 2019, but the government wanted to ensure that it was well integrated with other major policy reforms that were under development at the same time—so for example, the climate change strategy that has now been released—and then subsequently the events of the last 18 months have resulted in some deferral and reprioritisation of government's effort and resources, given the COVID pandemic, the bushfires et cetera. I can confirm that the government is still committed to releasing an air quality strategy and it is currently under development. While the strategy is still under development government has continued to invest in major initiatives that will improve air quality—so for example the *Environment Protection Act* that myself and Mr Miezis have referred to; the climate change strategy I mentioned, which will reduce greenhouse gas emissions and which will also reduce emissions of air pollutants; accelerating the move to renewable energy and zero-emission vehicles to reduce reliance on polluting fossil fuels; and investing in public transport to reduce reliance on motor vehicles. I cannot give you a definitive time as to when the strategy will be released. As I said, it is under development. There is still a strong commitment for it to be released, but there will obviously be approvals processes that will need to be gone through before the strategy is released—but it will definitely be released.

To your final question regarding I think it was a draft—

Ms TAYLOR: Yes.

Ms JACKSON: the strategy's development has been informed by multiple engagements with Victorians already, including submissions on air quality management priorities in response to the 2018 *Clean Air for all Victorians: Victoria's Air Quality Statement* and feedback from the August 2018 clean air summit and subsequent regional consultations. So at this point there are no plans for further consultation on the strategy.

Ms TAYLOR: Okay. All right. Now, Sonja, what are you thinking? Should we pass or do I get another one in?

The CHAIR: We might pass and come back around; we will see how we go for time. Thanks, Nina. This is going to be a challenge today, so let us see how we go. Mr Melhem.

Mr MELHEM: Thank you, Chair. Look, my question is really focusing on the inner west, and I refer to the report which I think was mentioned in the presentation. We understand the issues of transport and industry, and a number of recommendations are contained in the report. My question is: what are we doing immediately to alleviate the problem and what are we doing medium to long term? I understand it is a combination of transport—heavy transport—and industry. In the inner west and around Yarraville and so forth there is probably not heavy industry as such as anymore—it is basically transport. Can you take us through what we are looking at doing in the immediate and medium to long term to alleviate that problem?

Ms JACKSON: Thank you, Mr Melhem, for the question. I can certainly give you an overview of a range of government commitments in this area. There are quite a number, and there are also, as you have asked, a number of commitments and initiatives that are being delivered immediately and have already been announced by the government, and there are others that I guess are continuing work. So if I can give you some examples of the government commitments, perhaps in the interests of time we can give you a more fulsome list via a question on notice if you would like more detail.

But some of the examples of government action in this space are supporting the uptake of zero-emission vehicles through a $100 million ZEV road map, which was released in May 2021. There are a number of initiatives within that $100 million package. They include things such as $46 million for over 20 000 subsidies for zero-emission vehicles. There is $19 million for EV charging infrastructure and $20 million for a ZEV public transport bus trial, with a target that all public transport buses be ZEVs from 2025. There is $10 million to convert 400 vehicles in the government's VicFleet to ZEVs, which will then drive the second-hand market,

which is a really important point and need for the continuation of ZEVs, and there is also $5 million for our commercial sector zero emissions vehicle innovation fund.

As Mr Miezis and I have talked about, the government has also strengthened Victoria's statutory environment protection framework, which will further reduce industrial emissions. We are undertaking studies to better understand sources of inner west air pollution, including a source apportionment study. In addition to the $100 million ZEV road map there is $1.6 billion in renewable energy initiatives, which will again reduce reliance on fossil fuels. So there are things in there around the Solar Homes program, for example, which is to provide additional battery rebates for households and to extend solar panel rebates to small businesses through a new Solar for Business Program.

There is $540 million to accelerate the development of Victoria's six renewable energy zones and close to $13 million to fund the design and delivery of a second VRET reverse auction, which will bring up to 600 megawatts of renewable energy capacity online—and that is intended to fully power metropolitan Melbourne's trains. There is $797 million for the household energy savings package, which is the $335 million I mentioned earlier regarding the installation of efficient reverse-cycle air conditioners, and $112 million to upgrade the energy efficiency of 35 000 social housing properties. There is a lot, so I am trying not to pick up everything. As has been talked about, there is $1.7 million for further improving the early diagnosis and treatment of childhood asthma in the inner west. There is the West Gate Tunnel Project, which will remove truck traffic from multiple local streets. There is the planting of 500 000 trees for a cooler, greener west; assessing the use of the former Melbourne Market site for consolidated container storage; a range of initiatives to reduce air pollution associated with port of Melbourne activities; advocating to the commonwealth for the need for stronger national vehicle and fuel standards and for a national zero-emissions vehicle strategy; and a range of other initiatives.

I am conscious of time, but there are a number of activities occurring in this space and, as I said, we can probably provide you a little bit more detail or the full list via a written question on notice after the hearing if that works, Mr Melhem.

Mr MELHEM: Yes, thank you. Look, I would appreciate that. You got to what I wanted towards the end, but I would appreciate it if I could get more details on notice, specifically for the areas I have mentioned—not just the global thing, specifically what we are doing in the west and inner west; I am really interested in that. Thank you very much.

Ms JACKSON: No worries.

The CHAIR: Thank you. Dr Cumming.

Dr CUMMING: Thank you, Chair. This is a broad question, but would Victoria benefit from actually, on the boards that we sit on, trying to push the national standards to be higher, to be not dissimilar to what the world standards are? Because Australian standards for air quality are quite low. So that is my first question. And then specifically, this committee has heard a lot of contributions around our children and asthma and childcare centres and planning—that we seem to have missed the opportunity and that a lot of childcare centres are actually being built on main roads and in pollution areas. Would we benefit in actually having more say in our planning and health and wellbeing being part of that and air quality being a consideration in planning applications? And then my last question is around the specifics around industry waste, seeing that we are having a lot of waste fires; trucks and what we are going to do to lift those standards; trains—I do not think anyone has mentioned trains—and diesel; and then obviously all the other different and specific areas that we could concentrate on that could improve our air quality. I will leave it at that.

Ms JACKSON: Thank you, Dr Cumming. I might, if it is okay, just start with your question in regard to childcare centres, and then I will pass over to the EPA and Mr Lee Miezis to answer some of your other questions regarding standards and waste. So certainly reducing the exposure to air pollution of sensitive sites such as schools and childcare centres is important and it requires a number of actions, many of which are already being taken, to reduce motor vehicle emissions. I have talked about some previously—ZEVs, the greater uptake of public transport and other forms of active transport, and advocating for tighter emission control and fuel quality standards at the national level. In addition, local measures such as transport-orientated design, walkable neighbourhoods, traffic calming, tree-planting et cetera can help. *Plan Melbourne 2017–2050*

recognises the importance of appropriate urban design for sensitive uses, and guidelines to support this will be developed. So what I can say in terms of your question around taking into consideration the sites when childcare centres and other things are being planned for is it is something that the planning portfolio within the department is currently working on, and they are looking to release guidelines to support some of that consideration going forward. So I do not have much more information that I can give you. It is within the planning portfolio in relation to that aspect, but I am certainly happy to take that on notice and come back—

Dr CUMMING: And you are suggesting guidelines rather than strengthening the legislation to not allow it to occur?

Ms JACKSON: My understanding is the planning portfolio is looking at guidelines to I guess support understanding and implementation of the *Plan Melbourne* document. But in terms of whether there is legislative reform being contemplated, I will have to take that question on notice and the department can get back to you.

Dr CUMMING: Yes, I guess my specific question is: are there going to be any considerations towards planning to actually consider health and wellbeing in the legislation—rather than just guidelines or regs, actually saying you cannot do certain things around childcare centres or you cannot build childcare centres or schools or sensitive things in areas and you cannot pollute around them?

Ms JACKSON: Yes, and I will take that on notice and I will get our planning colleagues to respond to your particular question there.

Dr CUMMING: Great.

Ms JACKSON: I will, if it is okay with you, Dr Cumming, hand over to Lee Miezis in the EPA to answer your other questions.

Mr MIEZIS: Thanks, Carolyn. Thanks for the question, Dr Cumming. I will start with the standards, if you like, in reference to national standards. I will talk generally and then Dr Dennekamp can add some details, and then we will come back to waste fires. The short answer is EPA is very active nationally in influencing increases and improvements in air quality standards. The National Environment Protection (Ambient Air Quality) Measure, which I mentioned in the presentation, does establish a nationally consistent monitoring, assessment and reporting framework and does set ambient air quality standards for six pollutants—so carbon monoxide, carbon dioxide, sulphur dioxide, lead, ozone and particulate matter, both PM2.5 and PM10.

EPA led the review of the AAQ NEPM standards on behalf of all states and territories, and the review looked at standards for ozone, nitrogen dioxide and sulphur dioxide and proposed more stringent standards for all three measures, with further reductions to commence in 2025. The National Environment Protection Council made its decision on ozone, nitrogen dioxide and sulphur dioxide standards in April this year, and NEPC considered the impact statement and information received from the public during consultation on this proposed variation.

Now, NEPC's decision was based on several criteria, which included health protection, World Health Organization guidance, standards in leading jurisdictions, the capacity of Australian jurisdictions to meet standards, scale of health impacts and economic considerations, and NEPC's responses to feedback received are available in the summary of submissions and response document—so a long way of saying we are driving to improve standards. We look at global standards in doing that, and I think we have been effective as an organisation and as a state in really driving improvements at the national level. Dr Dennekamp, did you want to add any more detail to my response?

Dr DENNEKAMP: No, that was very comprehensive. Thanks, Lee.

Dr CUMMING: Sorry, you have just talked a lot about the national standards, and I guess my specific question would be, actually: are we going to raise our standards, our Australian national standards, to a world best practice standard? And are we anywhere near that? I guess I will ask a specific question: what are the Australian standards compared to world standards?

Mr MIEZIS: Yes, thanks. So obviously the national standard has been set nationally. But as I said, we have certainly driven increases, and we have also taken into account world health guidelines and standards across

leading jurisdictions in doing that. We will continue to drive towards that, but you would appreciate that the decisions on where national standards are set are not those for the EPA or for the Victorian government. But we do continue to influence and drive to see improvements, and we have been effective in doing so.

Dr CUMMING: I guess I just asked my specific question at an—

The CHAIR: Sorry. Dr Cumming, can you just let the witnesses continue to answer your question that you have already asked. We are going to have to watch time very carefully. Sorry, I note someone else was trying there—I think, Professor Taylor, you have got your hand up.

Prof. TAYLOR: Yes. Thank you for your question, Dr Cumming. I have looked at the standards that we have in Victoria and compared them to the WHO, and for the two contaminants of concern which we are primarily affected by, which are PM2.5 and PM10, we either match or beat WHO standards. Indeed the standard that we have for PM2.5—that is going to be lowered yet again in 2025, so we are ahead of the curve. Some of our standards are better than the national standards, and they also will be brought into the ERS, environmental reference standards, that we use in Victoria as part of our GED management. So I think, in terms of the guidelines that we use and the standards that we use, we are comfortably ahead of the curve. And of course, as you have already heard, the lower the air pollution, the better the outcomes for human health. But there are various reasons why there will be natural background levels—and Mr Miezis talked about that—which would include dust produced from agricultural areas, which would mean you cannot get to zero. I hope that answers your question.

The CHAIR: Great. Thanks. And look, we will come back around, Dr Cumming. So I will throw to Ms Bath now for a question.

Ms BATH: Thanks, Chair. And thanks, everyone, for being here. I have a question that relates to the Latrobe Valley. First of all, you have talked a lot about particulate matter, so matter from smoke. My interest lies in the fact that the Andrews government has called in the used lead-acid battery secondary recycling smelter; that is 1.9 kilometres away from a primary school. Many of the community in Hazelwood North and others are very concerned about the monitoring, or potentially not-good-enough monitoring, of that site, so I seek to understand, noting also that on those graphs you had before the Latrobe Valley featured very heavily in terms of air pollution: what is the EPA going to do in terms of monitoring, how is that real-time monitoring going to occur, how is that going to be fed back to the community and how can it be to acceptable standards, noting Mr Meddick's question about exposure in regions that are already high-exposure zones?

Mr MIEZIS: Thank you for the question. I will start, and then perhaps Dr Torre or Dr Dennekamp might want to add. EPA assessed the proposed facility, including consideration of risk to the environment and human health and the impacts of lead processing from the facility. We certainly also undertook a lot of engagement with local community. We engaged independent expert technical reviewers, and all of their recommendations were adopted and included in conditions that were attached to the works approval. EPA found that the proposed and modelled maximum air emissions were considerably lower than or below thresholds set under Victorian and international standards; the risks posed by lead from the facility, when combined with the facility's proposed pollution controls, were found to be negligible; and expected impacts on soil and air were both well below levels that were considered safe for human health. The human health risk assessment concluded that potential cumulative exposure from inhalation, skin contact and ingestion pathways is lower than health-based guideline levels. And when assessing inhalation of airborne lead, model concentrations were found to be about 350 times lower than levels that are not expected to pose a risk to human health.

In terms of our ongoing role at the site, EPA's works approval contains a range of conditions that the proponent must satisfy before the facility can be constructed. These include the requirement to develop an ongoing community engagement plan that will be used during construction and operation of the facility. EPA's conditions also require the development of a comprehensive environmental monitoring program, which will include real-time air emissions monitoring and ongoing environmental monitoring for impacts to air, to soil and to water.

In early June this year we were provided with the information that is required under the conditions, including designs for systems and buildings, a report and an environmental management plan. We are currently reviewing these and must approve those documents before the project can proceed to construction stage. The

proponent must also ensure adequate emergency planning and risk management to ensure safe operation of the facility, and the proponent will require an EPA licence to operate the facility, which will outline the conditions that they must meet to ensure risks to human health and the environment are reduced during the operation of the facility. So there are still a lot of steps to go in terms of really, if you like, putting that framework in place, and we are still assessing the information that has been and is being provided.

Ms BATH: Thanks, Chair, and thanks, Mr Miezis. One of the things—you raised it twice; I would challenge you about answering my question, though—that you said is that it is modelled on Chinese operations overseas. I think this is one of the grave concerns for the community, that it is modelled on something and then scaled down. The EPA, by virtue of the COVID pandemic, certainly did not get across to China. The community is quite concerned that these modellings are not actually going to be a true indication of what is going to be the situation. You mentioned monitoring, but you did not actually explain it. It might be something that you would provide to the committee at a later date—the actual level of monitoring. I also note that the EPA actually, on your list that you gave to the committee just now, had no programs running in the Latrobe Valley. I would ask you to—you can answer on notice—make some commentary about the actual monitoring that is going to happen, and I am questioning why you do not have any programs in the Latrobe Valley.

Mr MIEZIS: If I can take the question on monitoring, the preparation and approval of a monitoring plan is a condition. There is a condition that must be met before the site can be constructed. So that monitoring plan is to be developed. In terms of the modelling, perhaps, Dr Torre or Dr Dennekamp, you may have some comments to make on that. Equally we do and continue to do a lot of work in the Latrobe Valley, and they might choose to comment on that too.

Dr TORRE: Yes, I can answer to that, Lee. Thanks for the question. The modelling is only one aspect of the whole assessment. During the works approval there was an expert who came in to have a look at those controls and to then critique and vigorously review the capability of that technology to undertake those emissions. So it is all based on how much they can control and will the controls be effective. That independent then provided that back into the assessment process—just to understand that. But also in the works approval process there are mechanism systems in place. They need to demonstrate clearly, with evidence, that all the control technologies and the processes and systems are working accordingly, and they need to do those tests and show them so they can actually meet those emission rates. So there is that rigour in our assessments and developments, a process to try to ensure that. Once they are met, that is when EPA signs off on it. But they need to meet that standard. Now that we have got the new Act, the focus is really on the prevention and how effective they are in minimising and preventing those emissions. That is how the works approval system works.

Ms BATH: One very quick question. I understand that the expert came in slightly late to the scheme of planning, but if there is any information that the expert provided, it would be great for the committee to be able to see that. Thanks, Chair.

Dr TORRE: Yes, it is available.

The CHAIR: Perhaps that can be provided on notice. Dr Bach.

Dr BACH: Thanks very much, Chair. Thank you for the fascinating presentations. I was interested to hear some of the views of several of our guests regarding the dreadful bushfires in 2019 and 2020. I think I am right in saying that at that time something like 1.5 million hectares burnt. I would like to ask perhaps you first, Ms Jackson, based on obviously now a not insignificant period of time that has elapsed and an opportunity for reflection, what you feel the government could have done better at that time, especially regarding fuel load reduction.

Ms JACKSON: Thank you very much, Dr Bach, for the question. I will hand over to my colleague Mr Hamish Webb, who is here from the forest and fire area of the department, who can respond to your particular question about the bushfires. Thank you.

Mr WEBB: Thank you, Carolyn. And thank you for the question. You are correct: 1.5 million hectares in Victoria were burnt in the 2019–20 bushfires. In terms of fuel management and planned burning and bushfire risk reduction, we take a number of different approaches to managing bushfire risk, of which planned burning is a key part. The other parts we use are things like mechanical fuel treatments such as mulching and mowing and slashing, which we will see more and more of as we roll out that program over the coming years.

In terms of fuel management, in particular in East Gippsland, there was quite a significant program that was there in the last number of years. In terms of treating large areas of fuels we have really focused that in terms of the community risk that sits down there, how you manage risks to the communities and having a program that is designed to prioritise at this stage risk to life and property, which is what the program looks to deliver in that part of the world.

In terms of trying to get to the nub of the question around managing for air quality, the amount of smoke we have to look at is how much smoke comes from fuel management compared to bushfires. The 2019–20 bushfires obviously were a significant smoke event. We saw smoke events and we have seen them in the news in Victoria and in Melbourne, and our planned burn program needs to consider how much smoke is produced by bushfires and the risk of smoke from bushfires compared to the risk of smoke from our fuel management program. We have quite strong processes and procedures in place to manage smoke from our bushfires and planned burning. We have built and developed smoke models so we can make decisions and understand in terms of predictions of the likely impacts of our fuel management program on—how smoke from the planned burning program will impact on communities. We are able to model that, we are able to see where that smoke will come from and predict where it will go. We can then make operational decisions about whether burns will proceed or go ahead and also then put in place and work with the EPA—and I think Professor Sutton and the EPA spoke to it earlier—about how we then message the communities. Will that smoke event impact the communities to a level that is manageable? Will there be ventilation? And we mitigate our fuel management practices and programs in terms of how we ignite fires and when we ignite them. We look at ventilation, especially in the valleys of Gippsland and the alpine areas. How long smoke will stay within the valleys? Will it ventilate, will it clear out from the valleys over time or will it sit there? So we can choose and make those decisions in terms of the fuel management program that is delivered on public land.

We are also building the ability to consider private land burning, so we have been working with the CFA. We (CFA) have built a digital fire permit system that enables us to model and better understand the smoke impact of non-public land burns. So obviously we (DELWP) can control the burning program on public land and we now have a better understanding of the burning program on private land through the use of that digital fire permit system, and that gets us a better understanding of when and where we choose to undertake fuel management in Victoria. Sorry about the start of that one. I started going down a different pathway with my answer.

Dr BACH: Thank you, Mr Webb. That is very interesting and very useful, thank you. I know, Chair, that we have to move on, but I will just quickly note that it has been of interest to me that a criticism of the department's burning program has been a really strong feature of a number of our submissions from Indigenous groups and from other groups, not only in this inquiry but also in the concurrent inquiry that we are undertaking into ecosystem decline. I do not want to jump the gun, but given the significance and the volume of the contributions that we have received regarding this matter, I am sure that they will feature in our final reports and I would certainly commend that information that we have received ultimately to the department for your consideration.

The CHAIR: Okay. Thanks, Dr Bach. I might just ask a question at this juncture, if I can. There was some discussion earlier around air quality monitoring, and we have had some submissions from other groups talking about some projects overseas, in London, where there is very localised air quality monitoring. This is a project that has been done, I think, in conjunction with some universities and the local government authority in London—the council or whatever the equivalent is. I do not mind who takes this question, but is there any benefit in more localised air quality monitoring? Is it beneficial, but if not, why not? Then the second part is: I noted you were saying in terms of air quality monitoring that the data updates hourly. Is there an opportunity to look at real-time monitoring, and would that be useful or not useful?

Mr MIEZIS: Thanks. I am happy to take that question and then perhaps throw to Professor Taylor and others to give a view on real-time. But in general, we have recently expanded our air quality monitoring network across the state with the installation of 49 regional sensors across Victoria, and that does give much more localised information, particularly around particulates, which we have talked about as being the pollutant of most concern. I guess the short answer is, yes, it is useful. That is why we have expanded that network. We also have the capacity to deploy on a temporary basis to particular issues or incidents air quality monitoring, which then, again, provides quite specific and localised information on air quality impacts.

We see the expansion of our air sensor network into not just regional communities but communities across Victoria as being critically important to giving communities the information that they need to make decisions in terms of protecting their own health but equally informing EPA, DELWP and other parts of government in terms of the strategies we are taking to monitor or to reduce or improve air quality and equally the effectiveness of the actions that we take. So that is the long way of saying, yes, I think more air quality monitors localised is a good thing. Better information will result in better outcomes. But in terms of the specifics of monitoring, I might just ask Professor Taylor if he has got any comments to make.

Prof. TAYLOR: Thank you. That is a really good question. The EPA is supporting local communities in the Latrobe Valley, Bendigo, the Brooklyn area and also down near Port Melbourne with localised citizen science air quality programs. They are really important for many reasons. Firstly, it gives the local community an understanding about what is happening in real time at their locations. It allows them to be able to respond. It empowers the individuals to be able to respond to events, and that might mean coming indoors or thinking about taking relevant medications that they may use if they are prone to respiratory problems—an asthma attack, for example. It also helps industry to understand what its impacts are. There are ongoing and significant real-time monitoring activities in the Brooklyn area, and they also intervene in response to that. So it allows people to understand, educate and manage.

In addition to that, I think it is important to perhaps talk about preventative strategies. I think Martine might talk about the HEPA filter data, which is the use of high-efficiency particulate air filters in people's homes to remove particulate exposure. Do you want to talk a bit about that as a preventative strategy?

Dr DENNEKAMP: Yes. Sure, Mark. So we have actually partnered with the Australian Catholic University on this. We have evidence from overseas, specifically North America, that indoor air cleaners—so they are portable indoor air cleaners with HEPA filters—perform really well, but we had very limited information in Victoria. So before we would put that out as a recommendation we partnered with ACU, and in fact that study has just recently been finished, so it will be published soon. But what it did show is that the majority of the homes showed that infiltrated smoke would return to background levels within 30 to 45 minutes. Now, obviously when you talk about a longer term smoke event, staying indoors gives you some protection, but it clearly shows that with HEPA filters used appropriately in the right room we are able to create clean air spaces within the home if the HEPA air filters are used due to conditions and appropriately. The only problem with them is that they obviously cost a few hundred dollars, so they are not affordable for everyone.

The CHAIR: Great. Sure, thank you.

Prof. TAYLOR: Could I also add to that. I think there is a lot of focus on outdoor air, but indoor air is also a relevant matter of consideration. People spend between 70 and 90 per cent of their time indoors, and indoor air exposures can result from a number of activities, particularly cooking and poor ventilation during cooking. So even moving indoors is not necessarily always 100 per cent protection because of self-generated contaminants. Australian homes are quite leaky and, as indicated by Dr Dennekamp, air gets in, and without appropriate filtration people may well be exposed to their own home-generated indoor air contamination. So it is a complex problem, but part of the work that Health, EPA and DELWP have been doing is to educate people about what those risks are so they are better informed with the evidence, so that they then can consider what actions they can take and empower in their own homes.

The CHAIR: Great, thank you. All right, we have run out of time, but Dr Ratnam has not had a question yet, so I will throw to Dr Ratnam. Thank you.

Dr RATNAM: Thank you very much, Chair. And thanks, everyone, for your presentations and all the work you do, and apologies for my voice as well. Just in terms of some of the evidence that we have heard to date, while general air quality tends to be relatively okay in Victoria, we do have four of the 12 hotspots across Australia in terms of poor air quality, particularly in the Latrobe Valley and Melbourne's inner west. So we have heard quite compelling evidence—very damning evidence actually—up until now at this inquiry about some communities. We have heard from those communities, who basically say they have been asked to accept poorer health outcomes because of poor air quality.

I want to ask this question specifically to the EPA first. In the recent renewal of the coal-fired power station licences, we have heard evidence that the EPA did not limit point-source emissions strongly enough given the

levels of pollution in the Latrobe Valley, for example, where those coal-fired power stations are, and did not ask for stronger pollution control technology, which we know does work in limiting pollution. So my question firstly to the EPA is: why didn't you take those measures to limit point-source pollution given the poor outcomes the Latrobe Valley is facing?

And just another question—I know we are running out of time, so potentially take this on notice—and this is to Professor Sutton. We have also heard evidence around wood-fire heaters and the smoke pollution being so damaging to health. I was interested to know whether your office, potentially working with other agencies, was doing any work in terms of thinking about some of the initiatives, for example, in Launceston and Auckland, or New Zealand, that we know have worked to reduce the number of wood-fire heaters that people use, given how bad the outcomes are. But potentially that is on notice, given the time, so my first question would be to the EPA and the point-source pollution limits and technology that were not introduced.

Mr MIEZIS: Thank you, Dr Ratnam. I will start, and then perhaps Dr Torre might like to add. The review of the brown coal power stations was done as part of our periodic licence review process, which really focused on monitoring, reporting and pollution emission limits to ensure compliance with the state air quality standards. What we did do through that process is make changes to all three licences in relation to air emissions and to wastewater. So if I talk to some of the licence conditions which we introduced and which were designed to protect local environment and provide greater transparency on the operation, we certainly introduced limits for mercury, for fine particles, so PM2.5, and coarse particles, PM10. We reduced limits to most air and wastewater discharge parameters. We introduced the requirement for power stations to monitor air emissions continuously and to share that data with the community through their website. We required Yallourn to install a continuous emissions monitoring system to monitor oxides of nitrogen and sulphur dioxide in real time, which will then bring that facility in line with Loy Yang A and Loy Yang B, which already have that capability. For consistency, exemption hours for startup and shutdowns were aligned, and we introduced the requirement to monitor class 3 indicators, so for those extremely hazardous substances such as carcinogens.

In addition, a new condition was added which will require those licence-holders to complete a cost-benefit analysis for installing air emission control technologies on their plants, and that condition is for a plan to be agreed with EPA on when the control technologies will be installed, and licence-holders will be required to report to EPA on an annual basis to give an update on progress in implementing the plan. And that cost-benefit analysis, the plan and those annual progress reports will be public documents. But I might ask Dr Torre to give any more specific detail in relation to your question.

Dr TORRE: Okay. Thank you. It is a really important question because the power generators are a large source of air pollution. But I only want to make a couple of points to add to what Lee has already added in terms of the review. I think the first thing we need to consider is that the review was really done with the old Act, so we are looking at the air quality management framework. And that framework also dictates how you consider all the conditions of a licence—so, you know, it is the operation, the power it generates, the technology, the emissions, and also what is important too is what are the actual air pollution concentrations within the towns around Latrobe Valley. So that is all done as part of that; so it is all of that.

I think the other thing too, in putting these emission limits, is we have actually, by putting these limits, effectively limited the amount of coal that can be burnt by the power stations because of the limitations. And through this process as well they have done a number of upgrades to improve general efficiency and also maintenance to improve their main source of control, which is electrostatic precipitators. So it is really about that combined effort of trying to reduce those emissions and in the future looking at that control technology to drive those emissions down even further. Thank you.

Dr RATNAM: Thanks. I have some follow-up questions, but I might put them on notice given the time I think we have—

The CHAIR: And there was a question to Professor Sutton, yes.

Dr RATNAM: About wood-fire heaters and whether anything has been trialled or thought about in terms of some successful trials in New Zealand and Launceston.

Prof. SUTTON: Thanks, Dr Ratnam. I will take it on notice in terms of the detailed response, but we have been working with the EPA in relation to the air quality strategy, as has been referenced, noting that particulate

matter for woodfire burning is a disproportionate contributor given the small point source numbers, if you like, and so it is a significant issue, and it is one that has a not insignificant preventable component to it, and so especially with the challenges of climate change and what that will mean for bushfire seasons, it is one to absolutely focus on. But we will provide a detailed response in our QON.

Dr RATNAM: Thank you so much.

Dr CUMMING: Sonja, can I put one question on notice, just around the EPA and if they are looking at leaky houses when it comes to air quality?

The CHAIR: Very quickly, Dr Cumming.

Dr CUMMING: That is pretty much my question: will the EPA actually look at leaky houses as it comes to air quality, seeing that there are current programs around leaky houses being hot and cold and reducing energy bills? But could the EPA actually look at leaky houses and what the EPA could actually do around leaky houses to help air quality?

The CHAIR: Okay, great. Thanks, Dr Cumming.

Mrs McARTHUR: Sorry, could I get a question?

The CHAIR: Well, very quickly, Mrs McArthur, if it is very, very quick, because we are over time already. But, Mrs McArthur, you can submit questions on notice without putting them to air as well, so I am just letting you know that.

Mrs McARTHUR: It goes particularly to the particulate matter generation that is currently occurring in the Maddingley tip in Bacchus Marsh, and this project defies the EPA regulations on a continual basis. So can the EPA confirm that there will be no extra pollutants going into that depository, for instance, from the West Gate Tunnel Project?

The CHAIR: Okay. Thank you. Has EPA got that for a question on notice?

Mrs McARTHUR: I will put more on notice as well in relation to bushfires.

The CHAIR: Yes, you can. Thank you all very much for your contribution today and your submission. It has been very much appreciated. It is a really interesting area and a topic that you can see we are all very interested in. I am sure we have all got many, many more questions. But thank you all again for your contributions. With that, all broadcast and Hansard equipment must now be turned off.

Committee adjourned.