

Submission to the Ministerial Forum on Vehicle Emissions - Department of Infrastructure and Regional Development on the Vehicle Emissions Discussion Paper

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67 Payneham Road
College Park SA 5069
P 0422 974 857
E admin@dea.org.au
W www.dea.org.au

Healthy planet, **healthy people.**

DEA Scientific Committee

Prof Dave Griggs
Prof Stephen Leeder AO
Prof Lidia Morawska
Prof Hugh Possingham
Dr Rosemary Stanton OAM

Prof Stephen Boyden AM
Prof Michael Kidd AM
Prof Ian Lowe AO
Prof Peter Newman AO
Prof Lawrie Powell AC
Dr Norman Swan

Prof Peter Doherty AC
Prof David de Kretser AC
Prof Robyn McDermott
Prof Emeritus Sir Gustav Nossal AC
Prof Fiona Stanley AC

Introduction

Doctors for the Environment Australia (DEA) is an independent, self-funded, non-government organisation of medical doctors and students in all Australian States and Territories. Our members work across all specialties in community, hospital and private practices. We work to prevent and address the health risks - local, national and global - caused by damage to our natural environment. We are a public health voice in the sphere of environmental health with a primary focus on the health harms from pollution and climate change.

We note "*The Vehicle Emissions Discussion Paper seeks views on measures to achieve the Australian Government's greenhouse gas emissions reduction targets, air quality objectives, and improvements in energy productivity in the context of road vehicles*".

Health input into the discussion paper

We welcome the opportunity to submit to this Inquiry because vehicle emissions are a major public health issue and your decisions are able to make important gains in preventative health. We draw your attention to the 3,000 deaths per annum in Australia from air pollution; a figure greater than total road accident deaths. A significant proportion of these deaths and the chronic illness of thousands more is caused by vehicular pollution.¹

Therefore, we note with some concern that the Health Minister is not included in the Ministerial Forum. Our submission will particularly address the health harms and costs of vehicular emissions and pollution. The magnitude of these costs is such that inclusion of them in the economic consideration of the Forum would indicate the urgency for reform.

Health costs of air pollution

These are difficult to quantify but studies suggest they are huge. For example, the total health costs of annual emissions of common ambient air pollutants from all sources in the Sydney Greater Metropolitan Region were conservatively estimated to be between \$1 billion and \$8.4 billion per annum. This is equivalent to between 0.4% and 3.4% of gross state product. These were underestimates since the cost of illness did not consider the total cost of health outcomes. Furthermore, the study used estimation of the impact of PM₁₀ above a defined baseline thus excluding the impact of finer particles which may have a greater health impact than PM₁₀.²

We maintain that these financial considerations resulting from health impacts should be at the forefront of decisions made by the working group because Australia can act on them now for immediate health and economic benefit.

Health costs of green-house emissions

An indication of the huge costs of environmental and health damage from global warming due to greenhouse gas emissions can be gained by examining the costs of recent climatic events in Australia.

Since 2002, insurance losses have exceeded \$14 billion, while the Australian Government's costs were estimated at \$14 billion. Projected post-disaster expenditure for 2011-16 is ten times higher than expenditure for the period 1999-2010³. These costs relate mainly to infrastructure damage but recently it has been recognised that they are exceeded by hidden costs, due to short and long term health effects.

A report prepared for the Australian Roundtable by Deloitte Access Economics on the costs of extreme weather events details both the tangible costs of disasters, and the intangible damage to people, such as the health and wellbeing of the affected community, the lives destroyed from an increase in mental health issues, family violence, alcohol consumption, chronic and non-communicable diseases and short-term unemployment.⁴

The intangible costs of the Black Saturday bushfires in Victoria were estimated to be significantly higher than the tangible costs, at \$3.9 billion compared to \$3.1 billion respectively. The tangible asset loss from the 2010-2011 Queensland floods was \$6.7 billion and was exceeded by intangible losses of \$7.4 billion.⁵

Vehicular Emissions

Because the transport sector relies almost entirely on fossil-fuels, domestic transport is the second largest user of fossil-fuels (after electricity generation) in Australia and accounted for about 17% of Australia's greenhouse gas emissions in 2013-14. Light vehicles contribute about 60% of all transport greenhouse emissions.⁶ Greenhouse emission abatement in the transport sector is likely to be particularly cost-effective.⁷

Noxious gaseous emissions consist of pollutants such as carbon monoxide (CO), hydrocarbons, oxides of nitrogen and sulphur, and particulate matter (PM). CO is toxic and lethal only if concentrations are allowed to increase in an enclosed space. Oxides of nitrogen and hydrocarbons can react with sunlight to form ozone which creates photochemical smog. This process is accelerated on warmer days and will increase with global warming. Smog causes respiratory irritation and can worsen asthma. Sulphur dioxide also causes respiratory irritation and precipitates asthma as well as contributing to acid rain. The Discussion Paper does not describe the type of particulates produced but it is known that the relatively larger particles (PM₁₀) are trapped in the lungs and contribute to airways disease while the smaller PM_{2.5} can enter the circulation to contribute to vascular disease. If the term "particulates" refers only to PM₁₀ and not the smaller PM_{2.5}, then measures to reduce particulates may be leaving the community exposed to continuing damage from PM_{2.5}.

The reduction of vehicular green-house emissions is particularly important because Australia (and many other developed countries) are taking insufficient measures to reduce CO₂ emissions from their major source; that of coal-fired power generation. Analysts currently believe that the pledges we gave at COP21 are already unattainable as we have exceeded our carbon "budget" to avoid a global mean warming of 1.5°C and that 2°C warming will also be exceedingly difficult to prevent.⁸

Harmful Health Effects of Global Warming and Climate Change

Our health is absolutely dependent on natural systems - our "life support systems". We need clean air and water, a stable climate, healthy soils in which to grow our food, and rich, bio-diverse ecosystems. With over half of our medicines derived from nature, the dependence of our wellbeing on ecosystems cannot be overstated. Already, environmental degradation is leading to ever increasing extinction of species with current extinction rates being between 100 and 1,000 times the normal background.⁹ We are part of nature's complex web and cannot survive in isolation.

Climate change is the greatest threat to human health this century with climate destabilisation having both direct and indirect health impacts. Extreme weather events such as heat waves, bush fires, floods, storms and temperature-enhanced levels of urban air pollution have direct impacts on health, such as, drownings, burns, trauma due to flying and falling debris, dehydration and heat related illnesses. Indirect health impacts are those resulting from changes in ecologically-based systems and include lowered food yields, reduced access to clean water, vector-borne diseases and other infectious diseases due to displaced populations living in unhygienic conditions. Conflict resulting from large numbers of environmental refugees and mental health impacts from those affected by extreme weather events or those living in failing rural communities are also categorised as indirect health effects.¹⁰

Globally, forced displacement of populations from low-lying areas vulnerable to sea level rises will cause social and economic upheaval which is predicted to impact on the health of both the millions of displaced people and the countries in which they seek residence. This is particularly relevant to Australia with its close proximity to many Pacific Island and South East Asian countries.

Need for Urgency

The effects of global warming and consequent climate change are already being experienced in Australia and abroad. The years 2011-2015 have been the hottest 5 year period on record¹¹, and now February 2016 has just been declared as the hottest month throughout the planet on record.¹²

It is the warming of the land, seas and atmosphere close to earth's surface and subsequent changes to our climate that is predicted to cause increasingly profound harmful effects to human health and wellbeing.¹³

Global temperatures are on track to rise 1-2°C by 2050 and 3-4°C or more by 2100. Relatively rapid rises of 4°C or more have not been experienced during homo-sapiens planetary existence and so predictions arising from "business-as-usual scenarios" are most likely incompatible with human habitation. There is therefore, an urgency for swift mitigation strategies across all levels of society.

Issues listed in Terms of Reference

1. Implementation of Euro 6 or equivalent standards for new vehicles

While Australian law mandates that all new vehicles from 1st November 2016 conform to Euro 5 standards, these standards are already less stringent than those adopted in comparable countries where Euro 6 standards for light vehicles have been in place for nearly 2 years, and Euro VI standards for heavy vehicles have been implemented for at least 3 years. For light passenger vehicles, the higher standards mean a reduction of oxides of nitrogen by 56% for diesel, but no change in other emissions for petrol/LPG powered light passenger vehicles. There would be a similar reduction for light commercial vehicles; for heavy diesel vehicles, the stricter standards mean an even greater reduction in both particulates and oxides of nitrogen.

Since the majority of Australian vehicles are now imported from countries where Euro 6/VI standards apply, and since these standards are operating in the USA which has similar road conditions to Australia, it seems illogical that we remain many years in arrears.

2. Fuel efficiency for new light vehicles

The most important environmental measure is the amount of CO₂ emitted per kilometre of travel, rather than the distance travelled per litre of fuel consumed. This is because diesel fuel emits more CO₂ but allows for better fuel economy. While Australia does not have any mandatory efficiency requirements, it is expected that some CO₂ reductions will occur with the continued influx of vehicles from overseas where fuel efficiency standards have been introduced. However, this means that Australia will always lag behind other countries and in 2014 Australia was ranked last out of the 16 major OECD countries for the energy efficiency of the vehicular transport sector.

This position is untenable as already Australia has little chance of fulfilling its COP21 pledge with this "business-as-usual" approach. There is no substantial reason why Australia cannot aim for a higher standard such as the new standard in the US of 151gCO₂/km, compared with the average of 188g/km in our new light vehicle fleet in 2014.

3. Fuel quality standards

As well as CO₂, particulates, and oxides of nitrogen, there are other pollutants in fuel such as sulphur, carbon monoxide and volatile organic compounds. Of these, regulation of sulphur content is important because sulphur can affect the durability and operation of emission control systems such as catalysts and particulate filters.

Australia continues to allow vehicles to use 91 RON (Research Octane Number) petrol which can contain up to 150 ppm or 95+ RON (premium unleaded) petrol which can contain up to 50 ppm of sulphur. Even though most European light vehicle manufacturers specify the use of the higher octane petrol, in Australia this can still contain 5 times the sulphur content of petrol used in most developed countries, that of 10 ppm. This ranks Australia as 63 out of 64 OECD countries (ahead of Mexico only) in petrol quality based on sulphur limits. Active research should continue to see if Australian fuels reduce the performance of the European vehicles which are manufactured to the higher specifications.

While sulphur content of petrol sold in Australia may not reach in practice the relatively high allowable limits, the fact that it is permissible is unsatisfactory. Motorists purchase petrol based on their car manufacturer's recommendation and price, not on the content of pollutants which is not displayed at the point of sale.

The Discussion Paper describes how manufacturers need to match technology with local conditions and market demand. However Australians have demonstrated, by their choice of larger and more powerful vehicles, that fuel efficiency is low in their list of priorities. Even though the Australian Government's Green Vehicle Guide's website is available and provides the necessary information on fuel efficiency and emissions, it would seem that few use this to guide choice of purchase. Another factor operating at present and in the foreseeable future is that fuel is comparatively cheap and so running costs are not a major factor in the choice of purchase.

The Discussion Paper also describes how manufacturers require a lead-in time of 3-5 years to devise engines and vehicles which can operate effectively given the constraints of emissions and fuel efficiency coupled with stringent fuel quality standards. However, given the fact that most of our vehicles are now imported from countries where the higher Euro 6/VI standards apply, it would not be difficult to apply this standard to all new imported vehicles. Now that the future of the Australian car industry is in doubt, it would be reasonable to demand the slightly lesser Euro 5/V standards for locally made vehicles, but if there is any indication that the industry will

be resurrected, companies must be given the ultimatum that the higher standards will apply after a suitable lead-in time.

In answer to the specific Questions (Q);

- Q 1** Costs and benefits of implementing stricter emission standards for light vehicles has already been discussed above. Costs of introducing stricter standards for heavy vehicles (usually diesel) are likely to be re-paid many times over in reduction in health care costs of heart and lung diseases caused by particulate matter.¹⁴
- Q 2** As most developed countries have already adopted Euro 6/VI standards, these standards should be adopted for all imported vehicles during the next 12 months. For vehicles manufactured within Australia, much depends on the anticipated lifetime of manufacturing within this country.
- Q 3** Fuel quality standards do affect the adoption of Euro 6/VI vehicular standards, as these vehicles require fuels of higher octane rating and lower sulphur content to allow catalysts and filters to operate effectively. Therefore fuel standards here would have to be improved in line with OECD countries, and certainly raised above the position of being 2nd worst.
- Q 4** As well as a ban on the importation of vehicles with lesser specifications, taxation on any number of performance indices can be used as a strong disincentive. Fuel efficiency, though, should be the main target, so that large and heavy private use vehicles incur a high impost. Measures to restrict the ownership of large and wide vehicles also have benefits for other road users, because large vehicles restrict vision, and road and parking space, all of which add to cost and detract from safety. After all, taxation is used to discourage other habits or processes which damage or cost society, and this is precisely what we are facing with inappropriate private transport vehicles.
- Q 5** In some countries (UK and California) all in-use vehicles are tested annually or biannually. Vehicles failing tests cannot be driven or sold. Whether such strict measures should apply here is debatable and perhaps an extremely heavy impost could be applied instead. Revenue from this impost could help pay for testing on a large scale. However, if routine testing is still deemed to be too costly, all in-service vehicles could be checked as part of roadworthy testing for on-sales and the result displayed as in New Zealand. If the vehicle does not meet the original standards, the above actions could apply.
- Q 6** As motor-cycles contribute such relatively low emissions, the process of testing and checking would probably have little impact on emissions and would be uneconomic.

4. Emissions testing arrangements

DEA cannot make any comments on the process and method of vehicle testing. However to prevent manufacturers from adopting deceptive practices, regular testing should be given a greater priority. However, it may not be possible to test all vehicles and models so testing might have to be random, and if specifications are found wanting, severe penalties should be applied (see Question 5). In addition, the results of testing and a calculation of the total greenhouse gas (GHG) output of motor vehicles should be made available to the Environmental Protection Authority (EPA) at regular intervals.

- Q 7-12** are not within the purview of DEA.
- Q 13-16** relate to the quality of fuel. While we should be adopting world's best practice in fuel quality, we should still view this as a relatively short-term measure while we move to biofuels or electricity. Research into biofuels and non-carbon alternatives must have funding assistance from one of the bodies established for this purpose.
- Q 17-19** relate to the Green Vehicle Guide (GVG) website. Information on this website is extremely valuable but it is doubtful that many would examine it prior to purchasing. Perhaps car-sales people should be compelled by law to go through the GVG website with potential customers, just as there are mandated rules for disclosure prior to house auctions. Similar disclosure could be compelled for on-line purchase or sales through an agent.
- Q 21** covered in Q 5.
- Q 22** is not relevant to DEA.
- Q 23** Government should be taking the lead in purchasing fuel efficient vehicles and should advertise this practice to the wider community. Government should also encourage the use of electric and hybrid (or on-demand ignition) vehicles in the taxi industry because of the lengthy duration spent idling in queues and at traffic lights.
- Q 24-25** As mentioned before, taxes and charges can be used to encourage the purchase of fuel efficient vehicles, and incentives should be based on both efficiency and noxious emissions. Because electric vehicles have no emissions, they should have huge tax concessions and other incentives such as reduced parking fees and road tolls as in Norway. The fact that the electricity might be supplied from a high emitting coal-fired power station should not penalise the car purchaser as the source is beyond their control. However it must be emphasised that the transition away from coal-fired power must commence immediately as this would also encourage the purchase of electric vehicles and is an essential step in the overall effort to reduce GHG emissions.

Government should also look very carefully at fuel tax credits (subsidies) for certain businesses. For example, when fuel subsidies are given to the coal industry, the subsequent health cost to the community is not considered. These must be included in the final costing of a business (such as electricity prices) when evaluating the economic effect of the subsidy.^{15,16}

- Q 26** As outlined in response to earlier questions, any agent or trader selling new vehicles should be obliged by law to present to the prospective purchaser comparative information as contained in the Green Vehicle Guide.
- Q 27** Measures should include the supply of information as outlined above, and the use of taxes and fees to discourage low fuel efficiency. Because biofuels are carbon-neutral, incentives should be offered through removal of all excise on these and other carbon-neutral approaches. There is evidence that the acceptance of electric vehicles into the market will be greater than previously anticipated.¹⁷ Therefore assistance should be given to the establishment of infrastructure supporting battery recharging facilities. In addition, it is essential that there is an all-of-government approach to the influx of electric vehicles so that the appropriate stimuli can be given to the renewable energy industry to supply the increasing power requirement.

- Q 28** For the calculation of fuel efficiency, a pro-rata range of standards could be calculated for the proportion of biofuels used in the fuel mix. Obviously, emissions from the use of all alternative fuels would have to be analysed for particulate and noxious gas content and suitable standards derived.
- Q 29-31** Since Real Driving Emissions is the meaningful emissions measure, it seems logical to pursue this program which can complement laboratory testing, such as the new Worldwide Harmonized Light Vehicles Test Procedure.

5. Australian Government measures under the National Clean Air Agreement

DEA supports the recently announced strengthening of the NEPM for PM_{2.5} and expects the more stringent standards for PM₁₀ already supported by some states to be implemented nationally over the next year or two.¹⁸

6. Emissions Reduction Fund (ERF) and Safeguard Mechanism-transport measures

DEA commends the Government for providing positive incentives for new projects which reduce or avoid GHG emissions. However this scheme should be coupled with penalties or an impost for businesses which continue to pollute; otherwise high emitting industries will benefit from changes to their operations when they were aware of the vital environmental need to reduce GHGs years ago. In addition, it is highly doubtful that a widespread payment scheme is affordable and provides value for money.¹⁹ These principles can be applied to the transport industry just as they would be to other industries and businesses.

No precise information is given about the Safeguard Mechanism so no informed comment can be made. However, if it means that fines would be imposed on businesses which continue to pollute, then this would be a most desirable mechanism.

7. Infrastructure to support new vehicles including the Clean Energy Finance Corporation and Australian Renewable Energy Agency

There is no doubt that the future will see the virtual replacement of fossil fuel vehicles with those driven by battery or some source of fuel which results in net-zero carbon emissions such as biofuels, or gases such as hydrogen and ammonia. Battery charging would need to be supported by renewable energy sources but delays in the closure of coal-fired power stations and lack of incentives to increase renewables are providing obstacles. Many reports have revealed the feasibility of a shift to renewables, both in terms of cost and feasibility. The cost of electricity from renewables is now on a par with that from fossil-fuels and is cheaper when coal-fired power includes the high cost of the externalities.²⁰

Since there is a need for urgency in reducing our GHG emissions, more effort must be made now to hasten the transfer to low or zero-carbon emissions. Australia therefore should develop a policy for the transfer to electric vehicles to provide more confidence and certainty, and to generate momentum in this vitally important area. Thus the CEFC and ARENA could be directed to provide financing for vehicles which have low or negligible carbon emissions. If the CEFC is currently funding a fleet leasing company (as described in the Discussion Paper) every incentive should be given for the purchase of electric or hybrid vehicles.

With adoption of electric vehicles, it would be important to measure the emissions created by their manufacture and compare these with those created during conventional vehicle construction so that a total carbon footprint is created for both vehicular types.

8. National Energy Productivity Plan (NEPP)

The exact nature of this plan is unclear. If its aim is to stimulate more production per unit of energy used, then there should be a greater emphasis on the transfer of energy sources to renewables, as this transition will generate considerable cost savings over the next few years. As stated earlier in this submission, the sooner we move to renewables, the greater the savings in the long-term. Although this course may be implied by terms such as "...innovation in the energy market...", "...through innovation and competition, such as reducing barriers to entry in the market for new technologies..." and "Drive innovation in transport and infrastructure systems" (on page 33 of the Discussion Paper), the absolute necessity of transition from fossil fuels should be articulated.

Conclusion

The Australian Government is to be commended for its deliberations on mechanisms to reduce vehicular emissions of CO₂ and toxic particles and gases, while improving efficiency. In this submission, we have emphasised the compelling need to reduce CO₂ emissions promptly, because vehicular emissions form the second highest category of greenhouse gas formation, both locally and world-wide.

We recommend that the health costs be built into the deliberations of the Ministerial Forum for we believe they will influence the current need for more stringent controls, urgency and the prevention of ill health from pollution.

Measures suggested in the Discussion Paper and our Response can achieve considerable reductions without huge expense. These measures should dovetail with other carbon-reduction measures permeating throughout society as we need an urgent effort from all sectors to contain greenhouse gas emissions if we are to have any chance of avoiding climatic and environmental catastrophe.

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