

# Submission on the Gas Fired Recovery Plan

February 2021



60 Leicester Street,  
Carlton Vic. 3053  
0422 974 857  
[admin@dea.org.au](mailto:admin@dea.org.au)  
[www.dea.org.au](http://www.dea.org.au)

DEA Scientific Committee:  
Prof Colin Butler  
Prof David de Kretser AC  
Prof Robyn McDermott  
Prof Emeritus Sir Gustav Nossal AC  
Prof Fiona Stanley AC

Prof Stephen Boyden AM  
Prof Peter Doherty AC  
Prof Stephen Leeder AO  
Prof Lidia Morawska  
Prof Hugh Possingham  
Dr Rosemary Stanton OAM

Prof Emeritus Chris Burrell AO  
Prof Michael Kidd AM  
Prof Ian Lowe AO  
Prof Peter Newman AO  
Prof Lawrie Powell AC  
Dr Norman Swan

Doctors for the Environment Australia (DEA) is an independent, self-funded, non-governmental organisation of medical doctors in all Australian States and Territories. Our members work across all specialties in community, hospital and private practice. We work to minimise the public health impacts and address the diseases caused by damage to our natural environment.

Doctors for the Environment Australia welcomes this opportunity to submit comment to the Department of Industry, Science, Energy and Resources Consultation Note regarding the Federal Government's proposed Gas-led Recovery.

**DEA is opposed to the expansion of the gas industry because:**

1. The imperative to address the climate emergency by reducing our reliance on fossil fuels. The health of Australians is already being negatively impacted by climate change - impacts that will become more severe over coming years. The combustion of fossil gas is now the fastest growing source of carbon dioxide, the most important greenhouse gas causing radiative forcing.
2. The threat to the sustainability of Australia as a drying continent from the prolific use of underground water resources by gas mining and the possibility of contamination with chemicals used in the gas industry which may cause long term harm to health and food production.
3. Impending trade sanctions if Australia fails to curtail fossil fuel production. Strong climate targets in countries Australia exports gas to - mainly Japan, South Korea, and China - increase the risk of stranded assets.

**Introduction**

The Prime Minister, Scott Morrison, first raised the idea of a Gas-led Recovery in September 2020 during the COVID-19 pandemic. The coalition government, concerned with the economic impacts of the virus, appointed a COVID-19 commission to advise the government on a pathway out of the epidemic. The commission was chaired by a former head of Fortescue Resources and board member of gas resource company Strike Energy, Mr Nev Power.

Doctors for the Environment Australia argues that the proposal for a Gas-led Recovery has been presented as a *fait accompli*. The Department's invitation to comment states "The Australian Government has a vision for a gas fired recovery from COVID-19. This will be delivered by a variety of measures..." No consideration appears to have been given as to whether such a large undertaking, with enduring consequences, is in the best interests of Australia and the health of Australians, nor whether it is needed, nor whether it is the place of government to underwrite it. Above all, the role of gas in exacerbating the climate emergency and the fallacy of fossil gas as a transition fuel have not been considered.

Australia's management of the pandemic has been exemplary, with governments at all levels heeding the advice of health and other experts. There must be similar expert input from to guide government action on the economic recovery from COVID-19.

Doctors for the Environment Australia is strongly opposed to the expansion of the gas industry because of the imperative to address the climate health emergency by reducing our reliance on fossil fuels. The health of Australians is already negatively impacted by climate change – impacts that will become more severe and create a great health burden over the coming years.

**It is not possible to overemphasise the enormity of health, economic, security and environmental costs of an inadequate response to global warming.**

### The Climate Impacts of Expansion of the Gas Industry

Doctors for the Environment Australia argues that a gas led recovery is denying the best health outcomes for Australians now and for future generations. In 2020, 25 of Australia's most eminent climate scientists wrote a letter to the Chief Scientist stating that the use of gas as a transition fuel over decades is not consistent with a safe climate, nor with the Paris Agreement.<sup>1</sup> They pointed to the urgency of the climate crisis and wrote, inter alia,

*“The combustion of natural gas is now the fastest growing source of carbon dioxide to the atmosphere, the most important greenhouse gas driving climate change”.*

The authors also point out that we are already committed to a temperature rise of 1.3°C to 1.4°C which will have “escalating impacts”, global methane emissions from fossil fuel sources and agriculture are rising, and the rate of methane leakage from the gas industry has “far exceeded earlier estimates”.

The latest United Nations Gap Report, released in December 2020, reveals that the world is on a 3°C warming trajectory, which will be catastrophic for Australia.<sup>2</sup> Although emissions fell slightly because of the pandemic and measures to control it, much greater ambition to bring emissions down by around 7% per year will be required to have a 66% chance of limiting warming to less than 2°C.

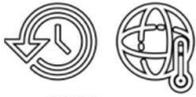
The IPCC Interim 1.5°C report made clear the urgent need to rapidly reduce short term climate pollutants, particularly methane, if the world is to stay below 2°C of warming and warned methane emissions will need to reduce by 35% or more if a sub-2°C target is to be achieved.<sup>3</sup> Methane is a powerful greenhouse gas, 86 times more powerful than CO<sub>2</sub> over a 20-year time frame. Global methane levels have been rising steeply in this century and are now at more than double pre-industrial levels.

---

<sup>1</sup> Australia's Chief Scientist is wrong on gas, say leading experts. The Sydney Morning Herald 25 August 2020 <https://www.smh.com.au/environment/climate-change/australia-s-chief-scientist-is-wrong-on-gas-say-leading-experts-20200824-p55oty.html>

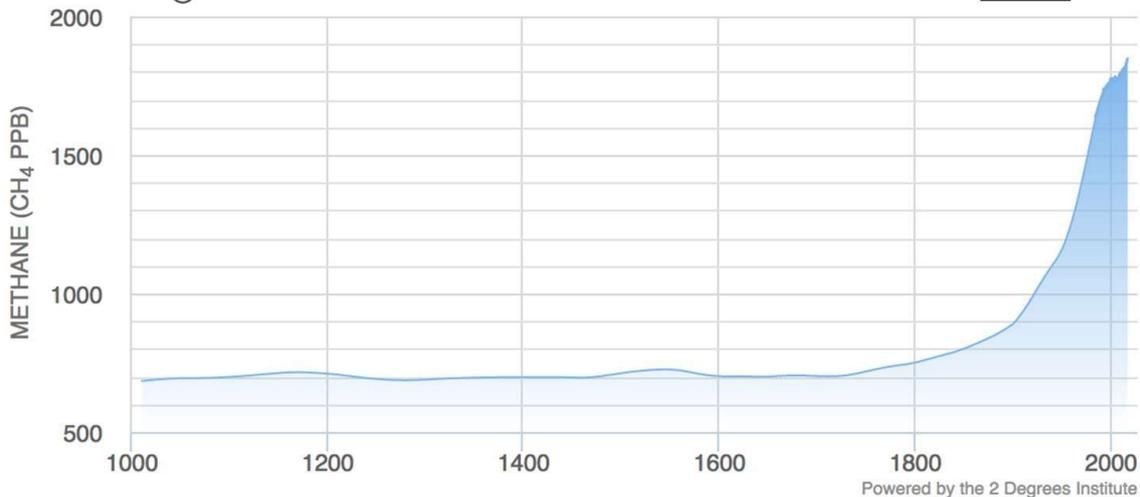
<sup>2</sup> Emissions Gap Report 2020 UN environment programme. December 2020 <https://www.unep.org/emissions-gap-report-2020>

<sup>3</sup> Global Warming of 1.5C - Special Report. IPCC 2018 <https://www.ipcc.ch/sr15/>



## GLOBAL CH<sub>4</sub> LEVELS

Click and drag in the plot area to zoom in



<https://www.methanelevels.org>

Research reveals fugitive emissions are an important source of steeply rising global methane levels and have been underestimated by 25%-40%.<sup>4</sup> Other research revealed that natural sources of methane have been overestimated.<sup>5</sup>

Evidence from around the world has shown that estimates of fugitive emissions can vary between 1.4% and 17%.<sup>6</sup> It is worth noting that when fugitive emissions are at 2% to 3%, any benefit that gas has over coal for greenhouse gas emissions disappears. In Australia, fugitive emissions from oil and gas production are estimated to account for about 6.0% of greenhouse gas emissions.<sup>7</sup> When the emissions from energy in the transport and processing for export of LNG, there is even less climate benefit of gas over coal.

A rise in fugitive emissions correlates closely with the expansion of the gas industry; the National Greenhouse Gas Inventory in its quarterly update to December 2019 noted in reference to fugitives from fossil fuel, “annual emissions in this sector increased by 6.1% over the year to September 2019. This increase in fugitive emissions was driven by an increase of 22.8% in natural gas production.”<sup>8</sup>

<sup>4</sup> Greenhouse gas concentrations in atmosphere reach yet another high. World Meteorological Association. 25 Nov 2019 <https://public.wmo.int/en/media/press-release/greenhouse-gas-concentrations-atmosphere-reach-yet-another-high>

<sup>5</sup> Hmiel B. et al. Preindustrial Carbon 14 in CH<sub>4</sub> indicates greater anthropogenic fossil CH<sub>4</sub> emissions. Nature: 578, 409-412 (2020) <https://www.nature.com/articles/s41586-020-1991-8>

<sup>6</sup> A review of current and future methane emissions from Australian unconventional oil and gas production. Melbourne Energy Institute. October 2016 <https://www.climatecollege.unimelb.edu.au/files/site1/docs/6032/20161023%20Review%20of%20Methane%20Emissions.pdf>

<sup>7</sup> Fugitive methane emissions factsheet – updated. CSIRO <https://gisera.csiro.au/factsheet/fugitive-methane-emissions-factsheet/>

<sup>8</sup> Quarterly update of Australia’s National GHG inventory: September 2019. Australian government <https://www.industry.gov.au/sites/default/files/2020-02/nggi-quarterly-update-sep-2019.pdf>

## The Climate Health Emergency in Australia

The World Health Organisation has described climate change as the defining issue for public health in the 21<sup>st</sup> Century and warns that “the severity of impacts of climate change on health are increasingly clear and threatens to undermine the last 50 years of improvements in health.” The direct and indirect effects of climate change (exposure to heatwaves, floods, droughts, bushfires and extreme weather events) are clearly and inextricably linked to the disruption of environmental conditions that provide the basis for our physical and mental health (air quality, clean water, food safety and spread of infectious diseases). Urgent action is needed to reduce emissions to keep global warming at less than 2°C. If we fail to do this, tipping points are likely to be reached after which, further limits on global warming and climate change will be exceedingly difficult to manage, water and food security will be at risk and some areas of Australia will likely be uninhabitable.

Last year most major medical organisations in Australia, and many others around the world declared a *Climate Health Emergency* and have called on governments for strong and effective action to reduce emissions and for recognition, preparation and management of the critical public health challenges ahead.

Australia’s vulnerability to climate change has become all too evident. The increased incidence of heatwaves, catastrophic bushfires, drought and the continuing drying of the southern half of the continent are now part of the climate record.<sup>9,10,11,12</sup>

Record heat has been recorded in many parts of Australia and Australia’s average temperature has increased by 1.44°C since records began<sup>13</sup>, well above the global average increase of 1.16°C reported by the National Oceanic and Atmospheric Association (NOAA) in March 2020.<sup>14</sup> Globally, 2020 was the second hottest year on record and ten of the warmest years on record have occurred since 2005.<sup>15</sup> The Bureau of Meteorology’s 2020 State of the Climate Report confirms that Australia’s future climate will see more heatwaves, longer and more intense fire seasons and more heavy rainfall events, marine heatwaves, ocean acidification, ongoing sea level rise, and more extreme sea levels.

---

<sup>9</sup> SA’s droughts are getting worse. University of South Australia. 13 June 2019

<https://www.unisa.edu.au/Media-Centre/Releases/2019/south-australias-droughts-are-getting-worse/>

<sup>10</sup> Hughes N, Galeano D, Hatfield Dodds S. The effects of drought and climate variability on Australian farms Australian government 13 Jan 2021 <https://www.agriculture.gov.au/abares/products/insights/effects-of-drought-and-climate-variability-on-Australian-farms>

<sup>11</sup> Drought response, resilience and preparedness. Australian government 2019 <https://www.agriculture.gov.au/ag-farm-food/drought/drought-policy>

<sup>12</sup> Charles SP et al. Climate analysis for south-west Western Australia. CSIRO July 2010 [http://www.clw.csiro.au/publications/waterforahealthycountry/swsy/pdf/SWSY\\_Climate\\_TechRpt.pdf](http://www.clw.csiro.au/publications/waterforahealthycountry/swsy/pdf/SWSY_Climate_TechRpt.pdf)

<sup>13</sup> Annual climate statement 2020. Bureau of Meteorology <http://www.bom.gov.au/climate/current/annual/aus/>

<sup>14</sup> Global climate report – March 2020 National Centers for Environmental Information <https://www.ncdc.noaa.gov/sotc/global/202003>

<sup>15</sup> 2020 was Earth’s 2<sup>nd</sup>-hottest year, just behind 2016. 14 Jan 2021 National Centers for Environmental Information <https://www.noaa.gov/news/2020-was-earth-s-2nd-hottest-year-just-behind-2016>

Extreme heat is Australia's biggest cause of death related to a natural hazard.<sup>16, 17</sup> Heatwaves are now hotter, longer and more frequent and are associated with surges in morbidity and mortality. Heatwave deaths are currently underestimated as the toll is often on those vulnerable with associated co-morbidities and heat is not recorded as a contributing factor.<sup>18</sup> In the heat wave of January/February 2009 in Victoria, in addition to 173 deaths directly related to the bushfires, there were 374 deaths above the average for that period; emergency callouts increased by 46%, presentations for heat related illness increased by 34 times, and cardiac arrests tripled.<sup>19</sup>

Bushfires in Australia have increased in intensity, duration and extent.<sup>20</sup> The unprecedented mega-fires of 2019/20 were 30% more likely to happen because of climate change, according to scientists, a figure described as too conservative by CSIRO scientist David Karoly.<sup>21</sup> In addition to the direct physical and mental health impacts of the fires, 80% of the Australian population was exposed to bushfire smoke over the months of the 2019-20 summer, Smoke is associated with a wide range of negative health impacts and an early study shows an estimated 445 deaths and over 3000 hospitalisations from that period.<sup>22</sup>

The Medical Journal of Australia calls for a national health protection strategy to protect populations from the risks of bushfire smoke, which include high rates of asthma, increased hospital presentations for cardiovascular and respiratory problems and increased mortality for vulnerable groups.<sup>23</sup>

### Health Should be at the Centre of COVID-19 Recovery Plans

Amid rising concern within the health profession of the health risks posed by climate change, Australia's peak medical groups issued a joint statement calling on Prime Minister Scott Morrison to place health at the centre of Australia's Covid-19 pandemic economic

---

<sup>16</sup> Melbourne and Adelaide have been Australia's most vulnerable major cities to killer heatwaves. The Conversation 15 August 2020 <https://theconversation.com/melbourne-and-adelaide-have-been-australias-most-vulnerable-major-cities-to-killer-heatwaves-100950>

<sup>17</sup> Heatwaves are Australia's deadliest natural hazard. ABC news. 18 Jan 2018 <https://www.abc.net.au/news/2018-01-18/heatwaves-australias-deadliest-hazard-why-you-need-plan/9338918>

<sup>18</sup> Longden T, Quilty S, Haywood P, Hunter A, Gruen R. Heat related mortality: an urgent need to recognise and record. Letter. The Lancet Vol 4 May 2020. [https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196\(20\)30100-5/fulltext?ref=theprepping-com](https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(20)30100-5/fulltext?ref=theprepping-com)

<sup>19</sup> Climate change and the health impacts of extreme heat. The Climate Council 2016 <https://www.climatecouncil.org.au/resources/silentkillerreport/>

<sup>20</sup> The facts about bushfires and climate change. The Climate Council 13 Nov 2019 <https://www.climatecouncil.org.au/not-normal-climate-change-bushfire-web/>

<sup>21</sup> Phillips N. Climate change made Australia's devastating fire season 30% more likely. Nature 4 March 2020 <https://www.nature.com/articles/d41586-020-00627-y>

<sup>22</sup> Johnston F et al. Unprecedented smoke-related health burden associated with the 2019–20 bushfires in eastern Australia Medical Journal of Australia 12<sup>th</sup> March 2020. <https://onlinelibrary.wiley.com/doi/full/10.5694/mja2.50545>

<sup>23</sup> Vardoukalis S, Jalaludin B, Morgan G, Hanigan I, Johnston F Bushfire smoke: urgent need for a national health protection strategy Medical Journal of Australia 2020: 212(8): 349-353 <https://www.mja.com.au/journal/2020/212/8/bushfire-smoke-urgent-need-national-health-protection-strategy>

response. The groups represent around 90,000 individual doctors, or 75% of the nation's medical workforce. The statement calls for a health-centred economic approach to support a transition away from fossil fuels - both coal and gas - to renewables, and investment in projects and technologies that preserve our natural environment.<sup>24, 25</sup>

A similar appeal was made by financial and industrial bodies including the big four banks and major corporations, to make 'sustainable investments' in areas such as health, clean energy and urban infrastructure.<sup>26, 27</sup> United Nations chief economist, Elliott Harris, has urged Australia and other countries across the world to place more ambitious climate action and investment in clean energy at the centre of their COVID-19 recovery plans. While business leaders in Australia have also been putting pressure on the federal government to prioritise renewable energy projects.<sup>28</sup>

In contrast, the National COVID-19 Co-ordination Commission is advocating for a 'gas-led' economic recovery in Australia and is discussing the provision of public infrastructure for gas delivery.<sup>29</sup> Continued investment in the expansion of gas infrastructure implies a committed future of GHG emissions, completely at odds with all expert scientific and health advice.

## Sustainability

### 1. The profligate use of water

Human health relies on access to clean water and productive land as well as a stable climate. But the sustainability of Australian water security and food production is under threat as our continent dries from climate change. These climatic changes are already evident in many parts of Australia with a temperature rise of 1.44°C but projections predict a 3°C rise by the end of the century. Fortunately, there is growing evidence that the international community is now acting on the climate emergency. By contrast, environmental and therefore economic sustainability in Australia is totally our problem. Successive Australian governments have shown little understanding of sustainability as vital for all economic activity and that a secure water supply is our most valuable resource.

This lack of understanding is evidenced by the multitude of national, state and local water regulations which rarely prioritise sustainability. This has been addressed by the

---

<sup>24</sup> <https://www.dea.org.au/wp-content/uploads/2021/01/2020-08-06-Healthy-Recovery-Letter-Scott-Morrison-PM.pdf>

<sup>25</sup> [https://dea.org.au/wp-content/uploads/2020/12/Gas-fired-recovery\\_frequently-asked-questions.pdf](https://dea.org.au/wp-content/uploads/2020/12/Gas-fired-recovery_frequently-asked-questions.pdf)

<sup>26</sup> Business chiefs urge PM to invest 'sustainably' for COVID-19 recovery. The Age 10 August 2020 <https://www.theage.com.au/politics/federal/business-chiefs-urge-pm-to-invest-sustainably-for-covid-19-recovery-20200807-p55jm2.html>

<sup>27</sup> 'Two global health emergencies': doctors back green stimulus. The Age 11 August 2020 <https://www.theage.com.au/environment/climate-change/two-global-health-emergencies-doctors-group-backs-green-stimulus-20200810-p55kd1.html>

<sup>28</sup> Australia must place climate action at centre of coronavirus recovery, chief UN economist says. SBS News 12 August 2020 <https://www.sbs.com.au/news/australia-must-place-climate-action-at-centre-of-coronavirus-recovery-chief-un-economist-says>

<sup>29</sup> Guarantee gas pipeline projects to spur COVID-19 recovery, Morrison told. Australian Financial Review 11 August 2020. <https://www.afr.com/politics/federal/guarantee-gas-pipeline-projects-to-spur-covid-recovery-morrison-told-20200811-p55kkl>

Government, commissioning the Productivity Commission Draft Report National Water Reform 2020. Their concern is economic productivity rather than sustainability and in a 220-page report, environmental sustainability is covered in less than one page.<sup>30</sup>

Water policy must prioritise the provision of water for the purposes of drinking, hygiene and basic comfort and wellbeing purposes for people, particularly considering the need for water as relief in high temperature days and nights. This priority is ensured also for agriculture, based on sustainability of the ecology and biodiversity. Only thereafter we can ask if there is water available for other economic activity.

These principles have been transgressed by the prolific use of underground water resources by gas mining. In the case of the Surat and lower Bowen basins, already on the verge of unsustainability, more gas (and coal) mines are being commissioned.<sup>31</sup> There is unmonitored use of water from the Great Artesian Basin and prolific use of groundwater in a drying region where no specific climate modelling has been done. Some bores are running dry, and farmers have deep concerns for the encroachment of mining activity on prime agricultural land in a region where there is early evidence of decline of ecological parameters. Most of these concerns over water usage, agriculture and environmental sustainability have been detailed for gas mining approvals process in the Narrabri region and in the Northern Territory. These concerns have been ignored.

## **2. Potential Irreversible contamination of groundwater by harmful chemicals**

This issue was extensively addressed in a Submission on the Narrabri proposal<sup>32</sup>, and on pages 22-25 of the Strategic Regional Environmental and Baseline Assessment (SREBA) Framework in the NT.<sup>33</sup>

The possibility of aquifer contamination imposes further long-term constraints on human and food production usage. Contamination with polycyclic aromatic hydrocarbons (PAHs) or endocrine disrupting chemicals (EDCs) associated with the gas industry would negate the use of large water resources for future human and agricultural use for many decades. This contamination can occur from wastewater or erosion of well casings which is well demonstrated. The crucial point is that these chemicals are likely to be bioactive in concentrations lower than we can measure them currently.

It becomes a matter for the application of the precautionary principle and whether gas mining expansion is more important to the long-term future of Australia than the possession of a currently viable long-term water supply in a rapidly drying climate.

---

<sup>30</sup> Assessment of National Water Initiative implementation process (2017-2020) Productivity Commission. Australian Government. February 2021. <https://www.pc.gov.au/inquiries/current/water-reform-2020/draft/water-reform-2020-draft-assessment.pdf>

<sup>31</sup> DEA submission to the underground water impact report for the Surat cumulative management area. July 2019. <https://www.dea.org.au/wp-content/uploads/2021/01/Underground-Water-Impact-Report-for-the-Surat-Cumulative-Management-Area-07-19.pdf>

<sup>32</sup> Submission to the IPC on the Narrabri coal seam gas project. [https://www.ipcn.nsw.gov.au/resources/pac/media/files/pac/project-submissions/2020/03/narrabri-gas-project/20200810t165753/submission-to-ipc-narrabri-gas-project\\_haswell-shearman.pdf](https://www.ipcn.nsw.gov.au/resources/pac/media/files/pac/project-submissions/2020/03/narrabri-gas-project/20200810t165753/submission-to-ipc-narrabri-gas-project_haswell-shearman.pdf)

<sup>33</sup> Shearman D, Haswell M. Expert comment on the strategic regional environmental and baseline assessment (SREBA Framework) in the NT consultation draft. Dec 2019. <https://www.researchgate.net/publication/349537526>

### Impending carbon levy for Australian exports

If Australia fails to curtail its fossil fuel production, there is a risk of a carbon border adjustment mechanism.<sup>34</sup> The environmental committee of the European parliament has recently voted strongly in favour of this mechanism – an idea that aims to place a carbon price on imports from less climate-ambitious countries.<sup>35</sup> Since most of the gas Australia produces is for export, it will fall foul of the impending carbon border adjustment if, and when such adjustments are adopted by countries importing Australian gas. The EU has already substantially reduced its domestic greenhouse gas emissions (GHG), while those from imports have been rising, thereby undermining the EU's efforts to reduce its global GHG footprint.

Indeed, as an increasing number of countries recognise the importance of action on climate change, trade deals with Australia will be withheld until Australia demonstrates more commitment to reducing emissions. The phase out of gas mining will be the most important sign of commitment because it is the major climate forcer.

Furthermore, the likelihood of stranded assets in the Australian gas industry has increased immensely as the world moves more rapidly to alternative forms of energy.

### Local health impacts of the gas industry

There is now a large body of evidence to indicate that populations living in proximity to gas fields have a higher risk of health problems. A review by Shearman and Haswell of over 1500 peer reviewed papers from health scientists and epidemiologists covers the years since 2013 when the massive expansion of the gas industry began in the United States.<sup>36</sup> In addition to the climate problem, the communities exposed to the gas industry are subject to a number of other health risks. The Executive Summary and a full account of health risks can be found in Appendix A.

The main points are:

- There is increasing concern about the use of a wide array of naturally occurring and introduced chemicals in the drilling and extraction processes, some of which are known to be toxic, while some are unknown or “proprietary in confidence”
- For those living near gas wells, there are reports of a higher incidence of asthma, sinus problems, skin rashes and headaches, and increased hospital admissions for heart, neurological, respiratory, immune system conditions, and some cancers.

---

<sup>34</sup> Europe trade talks: Australia urged to be ‘more ambitious’ on climate. The Guardian 11 Feb 2021  
<https://www.theguardian.com/australia-news/2021/feb/11/europe-trade-talks-australia-urged-to-be-more-ambitious-on-climate>

<sup>35</sup> Carbon levy on EU imports needed to raise global climate ambition. News European Parliament 5 Feb 2021  
<https://www.europarl.europa.eu/news/en/press-room/20210201IPR96812/carbon-levy-on-eu-imports-needed-to-raise-global-climate-ambition>

<sup>36</sup> Shearman D, Haswell M. The implications for human health and wellbeing of expanding gas mining in Australia Onshore Oil and Gas Policy Background paper December 2018.  
[https://www.researchgate.net/publication/329801892\\_The\\_implications\\_for\\_human\\_health\\_and\\_wellbeing\\_of\\_expanding\\_gas\\_mining\\_in\\_Australia\\_Onshore\\_Oil\\_and\\_Gas\\_Policy\\_Background\\_paper\\_2018](https://www.researchgate.net/publication/329801892_The_implications_for_human_health_and_wellbeing_of_expanding_gas_mining_in_Australia_Onshore_Oil_and_Gas_Policy_Background_paper_2018)

Other findings:

- Negative birth outcomes, including low birth weights, increase in preterm births and some reports of an increase in birth defects.
- Mental health effects including stress, depression and a breakdown of social cohesion.

In summary, the authors found:

*“Growing evidence of direct health impacts as well as a clear potential for indirect impacts of gas and oil mining on essential environmental determinants of health, including a stable climate, air quality, water quality, water security, food security, community cohesion and, in some locations, geological stability”.*

### **Safer and cheaper alternative to gas**

With the use of heat pumps for space heating and hot water and induction cook tops, homes can now economically go all electric, avoiding the health problems of gas and saving money. One study revealed that for states with a large amount of renewable energy these technologies have lower greenhouse emissions and are cheaper, and as wind and solar become more widespread this will be so for all states.<sup>37</sup> For homes with roof top solar (now over 2.3 million)<sup>38</sup> there is no reason to use gas.

The United Kingdom will ban gas for new home heating from 2025<sup>39</sup>, and all new homes in Berkeley, California, will be gas free.<sup>40</sup> Unfortunately, in Australia gas connections in some new housing developments are mandated, thereby locking out cleaner alternatives.<sup>41</sup>

As the largest LNG exporter in the world, it makes no sense that Australia must expand its gas industry and create gas import facilities. East Coast gas prices have been predominantly determined by demand for exports and international gas prices, not levels of domestic supply, and multiple economic analyses have concluded that importing more gas is not guaranteed to lower prices.<sup>42</sup><sup>43</sup> The Australian Energy Market Operator (AEMO), in its

---

<sup>37</sup> Anderson R. Emissions intensity of household electricity vs gas. Renew 29 July 2019

<https://renew.org.au/renew-magazine/efficient-homes/emissions-intensity-of-household-electricity-vs-gas/>

<sup>38</sup> Solar. Clean Energy Council. 31 December 2019

<https://www.cleanenergycouncil.org.au/resources/technologies/solar-energy>

<sup>39</sup> Gas heating ban for new homes from 2025. BBC news 13 March 2019.

<https://www.bbc.com/news/science-environment-47559920>

<sup>40</sup> Forcey T. Goodbye to Bass Strait gas. Renew 15 April 2020. <https://renew.org.au/renew-magazine/renewable-grid/goodbye-to-bass-strait-gas/>

<sup>41</sup> Shearman D, Haswell M. New estates are being forced to install gas pipelines. This is wrong. Renew Economy 30 Jan 2019 <https://reneweconomy.com.au/new-estates-are-being-forced-to-install-gas-pipelines-this-is-wrong-10697/>

<sup>42</sup> Robertson B. The staggering cost of gas in Australia. Institute for Energy Economics and Financial Analysis. July 2019. <https://ieefa.org/the-staggering-cost-of-gas-in-australia/>

<sup>43</sup> Robertson B. Australia's gas-led recovery is flogging a dead horse. 3 Nov 2020

<https://reneweconomy.com.au/australias-gas-led-recovery-is-flogging-a-dead-horse-33844/>

Integrated System Plan, envisages a declining role for gas this decade in all scenarios as renewable energy expands.<sup>44,45</sup>

### Health Risks of Gas Appliances in the Home

While gas is used in the home for cooking, indoor heating, and water-heating, there are negative health implications to indoor gas use.

Gas appliances are sources of indoor air pollution and there is a growing body of evidence showing that indoor gas use for cooking, and heating is bad for our health.<sup>46, 47</sup> The combustion of gas produces a number of pollutants, including carbon monoxide, nitrogen dioxide, fine particles (PM 2.5 plus ultrafine particles), volatile organic compounds, and polycyclic aromatic hydrocarbons. In modern well sealed homes particularly, these compounds can accumulate and cause health problems.

Carbon monoxide binds tightly to haemoglobin, interfering with oxygen delivery to the brain and other vital organs. Depending on the level of exposure, symptoms can be mild and subtle, such as headache, tiredness, and confusion, ranging up to unconsciousness and death. Misdiagnosis in mild cases is not uncommon and can result in continued exposure.<sup>48</sup>

Exposure to fine particulate matter is associated with higher rates of cardiovascular, neurological and respiratory disease, systemic effects indicative of inflammation secondary to penetration of the particles into the bloodstream.<sup>49</sup> Generally associated with fossil fuel use in electricity generation and industry, transport, and bushfires, these pollutants from gas use in the home can contribute to the burden of pollution related mortality.

Asthma is a common condition afflicting 11% of Australians.<sup>50</sup> A recent study has shown that 12% of childhood asthma is attributable to, or exacerbated by, cooking with gas stoves. This figure drops to 3.4% if high efficiency range hoods are used.<sup>51</sup>

---

<sup>44</sup> Saddler H. Why AEMO's ISP assumes over 100% wind and solar power and virtually no gas. 5 Nov 2020. <https://reneweconomy.com.au/why-aemos-isp-assumes-over-100-pct-wind-and-solar-power-and-virtually-no-gas-18330/>

<sup>45</sup> 2020 Integrated System Plan (ISP) 30 July 2020. <https://aemo.com.au/en/energy-systems/major-publications/integrated-system-plan-isp/2020-integrated-system-plan-isp>

<sup>46</sup> Seals B, Krasner A. Gas stoves: health and air quality impacts and solutions. 2020. [https://rmi.org/insight/gas-stoves-pollution-health/?utm\\_medium=email&utm\\_source=eoy-roundup&utm\\_content=all-rmi&utm\\_campaign=2020\\_12\\_31](https://rmi.org/insight/gas-stoves-pollution-health/?utm_medium=email&utm_source=eoy-roundup&utm_content=all-rmi&utm_campaign=2020_12_31)

<sup>47</sup> <https://dea.org.au/home-gas-appliances-and-your-health-fact-sheet/>

<sup>48</sup> Carbon monoxide and gas heater safety. Health Victoria. <https://www2.health.vic.gov.au/about/news-and-events/healthalerts/carbon-monoxide-gas-heater-safety>

<sup>49</sup> Loxham M, Davies D, Holgate S. The health effects of fine particulate air pollution. 28 Nov 2019. British Medical Journal 367 <https://www.bmj.com/content/367/bmj.l6609>

<sup>50</sup> Asthma statistics and facts. Asthma Australia <https://asthma.org.au/about-asthma/understanding-asthma/statistics/>

<sup>51</sup> Knibbs L, Wodeyohannes S, Marks G, Cowie C. Medical Journal of Australia 2018; 208 (7); 299-302. <https://www.mja.com.au/journal/2018/208/7/damp-housing-gas-stoves-and-burden-childhood-asthma-australia>

## Conclusion

Doctors for the Environment Australia is strongly opposed to the Gas-led Recovery proposal. DEA contends that the proposal will lock in the production and use of gas at a time when we need to be rapidly reducing emissions and our reliance on fossil fuels. Importantly, the gas industry's prolific use of water is threatening the sustainability of Australia's water resources.

The climate change emergency is an urgent health and environmental problem that requires effective leadership and solutions that will build on a low carbon economy to secure a healthy future for Australians.

Doctors for the Environment Australia urges the Australian government to commit to a national energy plan that prioritises the urgency of climate change. Accordingly, DEA urges a ban on new gas and other fossil fuel developments, and heavy regulation of existing gas developments while vigorously promoting a coordinated transition to renewable energy.

## Appendix A - Onshore Oil and Gas Policy Background paper 2019 Professor David Shearman and Professor Melissa Haswell

### Executive Summary

It is now recognised that the exploration and extraction of natural gas (methane) and oil from conventional and unconventional sources pose many potential direct and indirect risks to human health and wellbeing. As recently as 2013, there were few peer-reviewed publications available in the health science literature upon which to assess the potential local, regional and global health related impacts associated with these industries. Over the last six years, however, public health and environmental science researchers and doctors have published over 1500 papers, with a substantial body of research findings. This research comes mainly from the United States where rapid and expansive development of gas and oil fields has occurred in close proximity to residential areas.

This Paper presents a comprehensive review process that has been ongoing among Doctors for the Environment Australia's (DEA) unconventional gas group since 2013. It is informed by literature searches on PubMed, Scopus and the ROGER (Repository of Oil and Gas Energy Research) database, which have enabled DEA to make many evidence-based submissions to governments on the health implications of gas development proposals across Australia.

Of particular concern is the clear evidence of the substantial and rising greenhouse gas footprint of the expanding gas and oil industry that threatens global efforts to urgently reduce emissions. This is often underestimated through:

- Failure to consider the footprint of the entire lifecycle of gas production, processing, transport and use;
- Underestimation of the quantity and duration of fugitive methane emissions;
- Inappropriate application of climate-forcing potency of methane over a 100-year time timeframe (20 times more than CO<sub>2</sub>), rather than the more appropriate 20-year timeframe (86 times higher potency) given the already measurable health impacts of current rapid warming;
- Failure to consider the potential significance of large-scale methane-emitting accidents (e.g. Aliso Canyon storage facility in California) and leakages that are difficult to stop quickly;
- Failure to incorporate the negative political influences and economic competition between abundant gas from large expansions and low emission renewable energies in the energy market.

In addition to greenhouse gas emissions, a second major concern to health associated with gas mining is the wide array of chemicals used in drilling and hydraulic fracturing and released into the environment through airborne emissions and wastewater and emitted from the high level of industrial activity (eg. compressor stations, gas processing plants, on-site diesel-powered machinery, and heavy vehicles) surrounding the production process.

Potential chemicals of concern within shale and coal seam gas mining wastewater include volatile organic compounds notably benzene, phenols, polycyclic aromatic hydrocarbons (PAHs), heavy metals, salt and technologically enhanced naturally occurring radioactive materials that may become concentrated through treatment processes.

Studies examining the potential toxicities of chemicals found in shale gas wastewater have reported that while many have not been evaluated, some are known carcinogens and/or

have the potential for endocrine disruption and/or are associated with neurological, reproductive and developmental harm.

Many studies report evidence of pathways through which ground and surface water can, and in some cases has, been impacted by gas well activity, through spillage, injection procedures, spills or deliberate discharge of inadequately treated water and leakage from wastewater pits and ponds.

Potentially harmful substances emitted into the atmosphere during dewatering, gas production and processing, wastewater handling and transport include PM2.5 and PM10, volatile organic compounds, hydrogen sulphide, formaldehyde, diesel exhaust and ground level ozone. Measuring concentrations and human exposures to these pollutants is complicated as levels vary widely over time and location, making it difficult to directly link airborne exposures to health impacts.

The review also found accumulating evidence of associations between residence close to gas mining activities and reports of poorer health, such as asthma exacerbations, sinus conditions and migraines, skin rashes, fatigue and headaches as well as hospitalisations for heart, neurological, respiratory, immune system diseases and some cancers. While most of these studies have been conducted in the US, exploratory hospital-based studies suggest that similar trends may be emerging between regions with and without coal seam gas mining in Queensland, Australia.

Increasingly consistent observations of higher frequencies of negative birth outcomes, such as low birth weight, extreme pre-term delivery, higher risk births and some birth defects, have been reported to occur in pregnancies spent closer (around 2 or 3 km) to gas mining activities, compared to pregnancies spent further away, or in the same area before commencement of gas mining activities.

Increased levels of stress, depression and sexually transmitted infections, aggression, criminal activity and traffic accidents have also been reported among those living near gas mining. These changes likely reflect psychological and social disturbance among individuals and whole communities. Australian researchers have found that stress and worries about coal seam gas mining may contribute significantly to mental health risks among directly affected farmers.

Of particular concern to Australian agriculture and remote communities is research showing an unpredicted but consistent rise in water footprint—up to 7.7- and 14-fold increases in water usage and waste used per well in semi-arid regions across the United States.

In summary, the review found growing evidence of direct health impacts as well as a clear potential for indirect impacts of gas and oil mining on essential environmental determinants of health. These concerns include risks to a stable climate, air quality, water quality, water security, food security, community cohesion and, in some locations, geological stability. The cumulative impacts of these industries on the wider requirements for good health and wellbeing are extremely concerning. At a time when the dangers of climate change are becoming readily apparent through record-breaking heat waves, droughts, floods, forest fires and cyclones and increasing food and water security concerns, accelerating new and expanding existing gas developments is counterproductive to reducing greenhouse gas emissions. It is not possible to overemphasise the enormity of health, economic, security and environmental costs of an inadequate response to global warming.