LOCK THE GATE ALLIANCE
AUSTRALIANS WORKING TOGETHER TO PROTECT OUR LAND, WATER, AND FUTURE

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Submission: Independent Review into the Future Security of the National Electricity Market

Thank you for the opportunity to submit to this review of the National Electricity Market.

Lock the Gate Alliance is a national network of hundreds of community groups and tens of thousands of people including landholders, Traditional Owners, conservationists and other Australians that are concerned about the impact of inappropriate coal and gas mining.

Our interest in this review arises out of the impact extractive energy industries are having on rural Australia. If the future of electricity generation in Australia is going to mean more coal and gas mining alongside a weakening of already very permissive state government regulatory frameworks to protect people, landscapes, water resources and the social and economic fabric of rural Australia, then our members and supporters have a stake in the discourse.

This submission includes direct responses to comments made in the draft review report and answers to a collection of the discussion questions to which we are qualified to respond.

In general, it is our sad observation that energy policy in Australia for the last twenty years has been plagued by the vested interest of private companies who do not wish to see this country move smoothly and justly towards an energy economy that is not based on the extraction of fossil fuels. We would hope by now to see more objectivity, imagination and detachment.

These questions have been vexed and partial and for that reason, we believe that the utmost transparency is needed about this process. We urge the review to clearly report on its consultation with industry bodies and other stakeholders, those that have been involved in this first iteration of this Review and those that are engaged throughout the consultation process.

The review makes the point, "Governance of our energy markets needs to keep up with the pace of change." We strongly share this view. We do not brush aside the technological, political and policy challenges identified in the Preliminary Report, but we do not believe it offers a vision that keeps pace with the changes underway in energy markets and technology, not to mention our understanding of climate change thresholds.

Our National Electricity Market (NEM) was designed to transmit and supply electricity produced by the combustion of fuels that occur only in particular locations in large power stations. Adapting this to a radically different means of distributed electricity generation

from natural and renewable resources that occur everywhere is a daunting task. And yet, there can be no question that it can and must be done. It would be perverse for the Review to propose further financial and political commitment into fossil fuel for electricity generation at a time when the means to produce and store renewable electricity are so quickly evolving. We urge the Review to expand its vision beyond energy resource extraction limits and devise a blueprint for an adaptable, sustainable NEM that is fit for the radically different future that is rushing upon us.

Summary points

- A discussion about the future of the NEM cannot be separately wholly from a discussion about Australia's energy extraction and exports and this context needs to be addressed by the Review.
- The Preliminary Report fails to consider constraints and flow-on effects on the supply side of fossil-fuelled electricity. A blueprint for policy actions to manage the transition must address mining and supply issues including energy and water demand by mining and the social, environmental and economic damage that it does.
- The damage that energy resource extraction does to land, water and the social fabric of rural Australia no longer makes sense when electricity in particular can so easily and cheaply be generated by renewable sources and stored for large-scale use.
- The review's interest in expanded gas powered electricity fails to comes to terms with three important factors: rising gas costs will prevent gas fired power plants from replacing coal ones; new gas demand would put further pressure on prices and supply with flow-on effects for existing users; nobody has built or invested in the several open cycle gas turbine (OCGT) power stations on the books with Government approval for the last five years.
- The failure of the Preliminary report to give proper consideration to the role of concentrated solar thermal (CST) has led to a skew in favour of increased gas-fired electricity that is neither feasible, sustainable nor wise.
- The Preliminary Report ignores the energy benefits of solar thermal plants in providing dispatchable power when it is needed, just as gas peaking plants do. There is a concentrated solar thermal plant project tendering to replace the coal-fired generation that has closed in South Australia last year. Given that the South Australian blackout partly inspired this review, this is crucial information for the Review.
- Concentrating solar thermal in fact may be far better able to complement variable renewable energy sources than open cycle gas power. It has the same beneficial synchronous nature and rapid ramp up and ramp down capability, but without the downside of gas power: gas prices rises, greenhouse emissions, and the risk of supply shortages for fuel stock.
- In general, coal and gas prices will be unpredictable and volatile in the coming years. Australia can manage prices and reliability by more rapidly adopting renewable energy options for industry and electricity needs. If we manage this, our energy future will be protected from the booms and busts of the resource sector, and will benefit from the switch to energy options for which the cost of supply is generally coming down.
- We recommend the Review look at the 2015 ARENA report into the options for reducing industrial gas use with renewable energy.
- We also recommend the Review consider the findings of the Melbourne Energy Institute's report into the South Australian electricity market. It reveals the role that renewable energy has played in bringing down wholesale prices, the price pressure that a reliance on gas peaking power can bring, given the onset of LNG exports from eastern Australia, and the need for orderly planning and management.

Introduction

Lock the Gate Alliance is alarmed and surprised to see the strong statements in the review that there is an "increasingly urgent" need for greater gas supplies for electricity generation. It indicates that the Review needs to develop a wider understanding of the inter-connection of energy resources extraction and supply markets with the National Electricity Market.

The rising price of gas for the East Coast Gas Market due to the exposure to international prices from the Gladstone LNG terminals will put some industry out businesses. That is not the result of state governments making sensible regulation for the protection of farmland, public health and water resources from unconventional gas mining. It is the direct result of greed and short sightedness of energy resource companies pursing export gas to the detriment of domestic price and supply. It is our fear that those same companies are still whispering in the ear of Government, telling them, contrary to the evidence and common sense, that the solution to the predicament they have landed us in is to continue allowing them to expand mining.

A discussion about the future of the NEM cannot be separately wholly from a discussion about Australia's energy extraction and exports. The review leads with a strong assertion that there is an urgent need for more gas to be mined in Australia, but does not sufficiently investigate the context for this statement. If the review is to provide the blueprint that COAG has requested, more attention must be given to the fuel extraction and export part of the energy industry.

Lock the Gate Alliance is intimate with supply side of fuel extraction in Australia. These extraction industries come at a heavy environmental, social, health and economic cost in the regions where they are concentrated. In the past, when there was little alternative, the benefits of abundant energy and the smaller scale of these industries was weighed in the balance against this damage. In this century, however, the scale of mining for export has accelerated to unsustainable scales and there are plentiful alternative methods available for generating, storing and sharing energy. The equation has fundamentally changed and Australia must change with it. The damage that energy resource extraction is doing to the land, water and social fabric of rural Australia no longer makes sense when electricity in particular can so easily and cheaply be generated and stored.

The review's interest in expanded gas powered electricity does not come to terms with the reality that rising gas prices will prevent gas fired power plants from replacing coal ones. Neither does it address the effect that further gas demand, which new gas fired electricity would stimulate, would have on prices, and the flow-on effects of this. Neither does it address a very obvious reality: there are facilities that would provide several thousand megawatts of open cycle gas-fired electricity across the east coast that have government approval and have had for years, but nobody has built them. Several have been shelved. The hour of gas power has passed and instead, investors are proposing new and different methods of electricity generation that do not require damaging mining activities to continue expanding in stressed landscapes. The task of the review is not to push gas mining onto unwilling regional communities but to propose a blue print for a smooth transition towards the kind of electricity generation that investors and the public want built: renewable, non-extractive and non-polluting.

Coal

The review asks: 3.5 What is the role for low emissions coal technologies, such as ultra-supercritical combustion?

There is no role for this in Australia. It is unnecessary and nobody wants to build it.

The absence of considerations around resource extraction issues from the Preliminary Report's considerations will lead to a failure to prepare for future jolts for which we must prepare. For example, in New South Wales Peabody Australia's Wilpinjong mine has a contract to sell 70% of the coal it mines to AGL Macquarie to supply Bayswater and Liddell power stations at a price of just $32.90 per tonne, around half the price it could receive for the coal on the export market. This contract expires in 2026. The company is currently seeking approval to expand the mine so that it can export a greater proportion of the coal it mines now, and continue the operation of the mine beyond its current 2027 life. By switching to the export market after the contract ceases, it could secure double the price it now fetches for its coal (dependent on the export price).

The problem is that the privatisation of electricity assets has left us the public and the Government in the dark about what will be done to address this looming supply cliff for AGL Macquarie. Will it enter into new contracts for coal supply, at near double the current price? What effect will that have on electricity prices? Or could we, by 2026, have sufficient alternative supply available to replace Bayswater and Liddell with renewable energy? Such a scenario seems fanciful, but with concerted and sensible policy and investment, seems more possible now than it did just five years ago.

A report by the Melbourne Energy Institute has crucial insight to contribute to the Review's blueprint. It found that reliance on gas peaking power in the wake of coal closure accentuated the wholesale price impact of the Northern coal power station closing in South Australia. It also highlighted the importance of coordination, something that is sadly lacking in energy policy around the country:

> A disorderly sequence of station withdrawals and mothballing and interconnector upgrades in South Australia has clearly impacted the way the prices have unfolded. In particular, the closure of Northern, in May, prior to completion of interconnector upgrades has severely accentuated the price impacts, and enhanced the conditions for the exercise of market power. At a broader level, the policies that have opened up of the east coast gas market to international gas pricing have had disproportionate impact in South Australia, and flag tensions between national gas market developments and the Renewable Energy Target.[1]

Released four months before the state-wide blackout in December 2016, MEI report clearly warned that havoc comes in times of transition when there is no coordination. The privatisation of electricity generation in much of eastern Australia makes coordination challenging to say the least. But, as with the reckless opening up for three LNG export terminals in quick succession in Queensland, that horse has bolted. The challenge facing the Review, and the country, is how to manage the withdrawal of coal power in a way that does

[1] McConnell and Sandiford, August 2016. "Winds of change: An analysis of recent changes in the South Australian electricity market. Melbourne Energy Institute. http://energy.unimelb.edu.au/__data/assets/pdf_file/0017/2054132/SA_PRICES_FINAL.pdf

not further concentrate market power and provides reliable and reasonably-priced energy for households and industry. Furthering our reliance on gas for electricity as coal plants retire will not do either of these things.

Gas

The review asks: **6.1 What additional mechanisms, if any, could be implemented to improve the supply of natural gas for electricity generation?**

The review's core premise that additional gas-fired electricity is "essential" to the energy transition fails to account for a number of important factors in the mining, transmission and use of gas.

Greater gas supplies have been brought on in eastern Australia at an accelerated pace in the last five years. Supply is not the problem. Very obviously, the problem is the Gladstone LNG terminals, three of which were approved to be built in quick succession by the Queensland and Federal Governments in 2010 and 2011, throwing the eastern gas market and the industries that rely on it into turmoil. Unable to meet the contracts they had so recklessly entered into to export gas from these terminals, the companies that own them are now buying up gas that was previously available for domestic use. There are reports that manufacturers cannot secure new gas supply contracts. Converse reports indicate that the Asian customers to whom the exported gas is contracted no longer need it all and are awash with excess cheap Australian gas, while our own industries get sent to the wall. The situation is absurd. It is a market failure of spectacular scale. Our interest in this matter is that rural communities in Victoria, New South Wales and the Northern Territory are being told it is their fault that this is happening and that they must accept industrial gasfields for the good of the country.

Unconventional gas is expensive to extract and process[2] and large new gasfields will do nothing to bring down gas prices for consumers or to make gas fired generators plausible to replace coal ones. Indeed, the gas export industry in Queensland has significantly increased electricity demand at a time when the rest of the NEM demand is falling. Expanding the mining of gas will increase NEM demand, do damage to land and water, fracture rural communities and economies and only exacerbate the turmoil that the gas companies in cahoots with the Queensland and Federal Governments have inflicted on us.

Communities are not going to roll over and allow industrial fracking gasfields across agricultural lands and water resources and this sentiment will not change. The review report underestimates the growing scientific evidence on the harms of onshore unconventional gasfields[3], and the community driven movement to prevent new onshore gasfields, which must be taken into consideration if he is to make recommendations in the real world. The review also pays no heed to the high water consumption of unconventional gasfields[4]. There

[2] See for example, the cost curve for eastern Australian gas production presented in Figure 5.1: Aggregate Gas Supply Forecast for the East Coast for 2018, page 27 of "Pipe Dream: a financial analysis of the Northern Gas Pipeline." May 2016. http://ieefa.org/wp-content/uploads/2016/05/Pipe-Dream-A-Financial-Analysis-of-the-NEGI-MAY-2016.pdf

[3] Toward an Understanding of the Environmental and Public Health Impacts of Unconventional Natural Gas Development: A Categorical Assessment of the Peer-Reviewed Scientific Literature, 2009-2015: http://journals.plos.org/plosone/article?id=10.1371%2Fjournal.pone.0154164

[4] UNEP Global Environmental Alert Service, 2012, Gas Fracking: Can we safely squeeze the rocks?

is no modelling to indicate Australia can afford an expanded unconventional gas industry and we have no confidence in the Government to take an objective view of this matter, given the highly charged and emotive statements that have been made about it thus far. There is no modelling that addresses the methane emissions of the expanded gasfields that the Government and the review are so convinced are necessary. The simplistic analysis of gas as a climate solution presented by the Preliminary Report completely disregards the potent fugitive methane emissions of extracting, processing and transporting gas, particularly unconventional gas.[5]

As we have previously stated, the realities, constraints and contexts of energy fuels extraction must be part of the review's remit if a robust blueprint is to be prepared. Without the water, energy, greenhouse, social and economic factors involved in expanded coal and gas mining being properly considered at this stage, the review will repeat the mistakes of the past, catapulting Australia into reckless and ill-considered decisions for which the public pay dearly.

The review acknowledges that pursuing gas power will contribute to rising wholesale electricity prices: "In the next few years, wholesale electricity prices are expected to rise, driven by the closure of coal-fired generators and the increasing cost of gas – an essential fuel in the energy market transition." The Preliminary Report incorrectly attributes gas price rises to supply constraints. Energy analysts have indicated that the gas price rise was the result of LNG exports coming online in the east, linking our domestic supplies to the most expensive gas market in the world, the north Asian market, coupled with cartel type behaviour of the three major gas producers in Eastern Australia.[6] In February 2015, AEMO commissioned Core Energy Group to conduct analysis of the cost of production and transmission of gas in Eastern Australia, because "The [eastern Australian] gas sector has entered a period which is characterised by a significant upward trend in cost structure, attributable mainly to increased labour, service and capital costs, lower well productivity, and a downward trend in gas liquid yield." In that report, the average cost per GJ of the four conventional gasfields in the reference productivity scenario was $4.39/GJ. The average cost per GJ in the CSG areas, even in the reference case productivity scenario is $5.66, and that is before transmission costs. The range in costs is $3.55 for Spring Gully in the Bowen Basin to $7.25 in Gunnedah and $9.5 in the Western Surat. A report prepared for the Department of Industry in 2015 showed gas prices paid by industrial customers "steadily rising" for industrial customers in the eastern states.[7] That report repeats the mantra that new supplies of gas are needed to address this price rise, but also admits "it is not clear if excess supply will occur to put downward pressure on the wholesale gas component and ultimately ease gas price pressures. A key issue is that any new gas supplies will likely be more expensive as these will likely be drawn from unconventional gas sources which have distinctly different cost structures to conventional gas."

There are already cost effective options for replacing gas needs for industry and for electricity supply, notably, fully dispatchable power from Concentrated Solar Thermal (CST).

Concentrating solar thermal in fact may be far better able to complement variable renewable energy sources than open cycle gas power. It has the same beneficial

[5] Melbourne Energy Institute, 2016, http://energy.unimelb.edu.au/library/a-review-of-current-and-future-methane-emissions

[6] IEEFA "Australia's Natural-Gas Cartel Is Bleeding Australia" http://ieefa.org/ieefa-update-australias-natural-gas-cartel-bleeding-australia/

[7] Oa

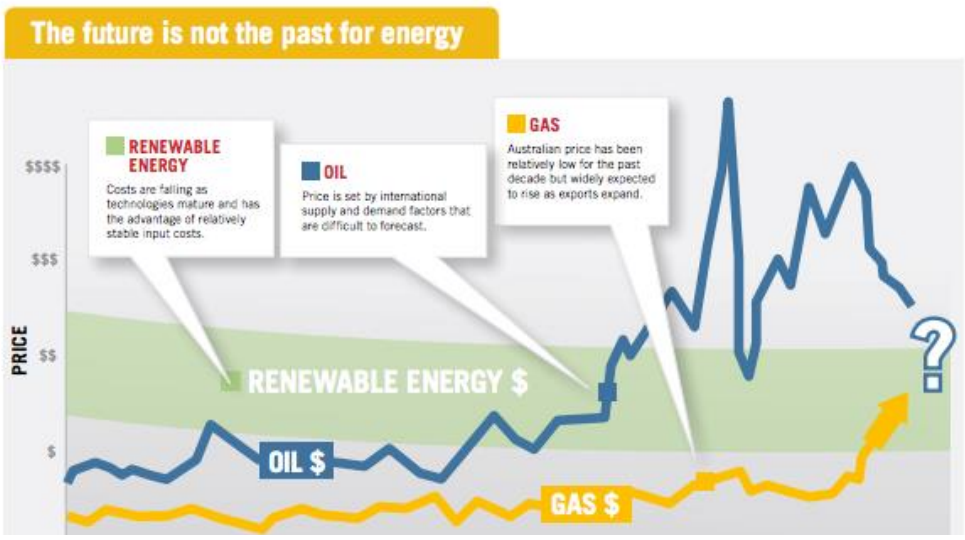
synchronous nature and rapid ramp up and ramp down capability, but without the downside of gas power: gas prices rises, greenhouse emissions, upstream land and water impacts and the risk of supply shortages for fuel stock. The Preliminary report states, "A reduction in gas-fired generation capacity has implications for the security and reliability of the power system, due to the loss of its contribution to ancillary services and its ability to be rapidly dispatched to meet increases in demand or shortfalls in supply." This is precisely the reason why replacement options for energy that can also be rapidly dispatched to ensure energy security, such as CST, should be considered in detail as part of this review.

Consideration must also be given to the price and availability of gas and the high production costs of onshore gas fracking. The production costs for east coast coal seam gas are amongst the highest on the global market.[8] It is alarmingly simplistic for a NEM review to blithely call for increased gas supply without engaging with any of the constraints that will apply to gas mining.

One considerable problem not addressed by the Preliminary Report is the obvious reluctance of anyone to build a gas power station. The only proposed gas power station project in NSW, AGL's Dalton project, was shelved by the company five years ago. The development consent for the power station expires in October this year. In Queensland, the Westlink power project, for staged development of a 1,000MW gas peaking plant, was to be developed in 2018-22, but has been shelved in part due to intense controversy and in part because market conditions did not suit.

The review asks 2.3 How do we ensure the needs of large-scale industrial consumers are met?

The Australian Renewable Energy Agency commissioned a report into the options for reducing industrial gas use with renewable energy. The analysis focused on renewable energy options that could be installed at the sites of existing industrial gas users and



Source: ARENA https://arena.gov.au/wp-content/uploads/2015/11/ITP_REOptionsForIndustrialGas_Summary_Med_FA.pdf

[8] See for example, the cost curve for eastern Australian gas production presented in Figure 5.1: Aggregate Gas Supply Forecast for the East Coast for 2018, page 27 of "Pipe Dream: a financial analysis of the Northern Gas Pipeline." May 2016. http://ieefa.org/wp-content/uploads/2016/05/Pipe-Dream-A-Financial-Analysis-of-the-NEGI-MAY-2016.pdf

incentives to move away for the need for gas, particularly the lower heat requirements where there are cost effective alternatives to gas. We recommend this report to the Review.[9]

In general, coal and gas prices are going to be unpredictable and volatile in the coming years. As the graphic above, drawn from the report, illustrates, Australia can manage prices and reliability by more rapidly adopting renewable energy options for industry and electricity needs. If we manage this, our energy future will be protected from the booms and busts of the resource sector, and will benefit from the switch to energy options for which the cost of supply is generally coming down.

The alternatives

The review asks: 1.2 How can innovation in electricity generation, distribution and consumption improve services and reduce costs?

And 1.3 What other electricity innovations are you aware of that may impact the market in the future?

Distributed energy generation and storage will reduce costs for consumers and lead to less pressure on the grid. It presents a challenge to private fossil fuel energy generators because it disrupts the previous market pattern where most of the profits made by energy companies were made in narrow windows of peak demand. By flattening the peaks, distributed generation and storage makes the grid more stable, but presents a threat to the large fossil power stations. Perhaps that is why we are having a conversation premised on new fossil fuelled electricity generation.

The Preliminary Report completely ignores the energy benefits of solar thermal plants in providing dispatchable power when it is needed, just as gas peaking plants do. There is a concentrated solar thermal plant project tendering to replace the coal fired generation that has closed in South Australia this year.

Due to the Gladstone situation and the Government's reticence to intervene with the gas cartel behaviour on the East Coast, a useful solution for clean, cost effective, dispatchable energy output increasing in the next 5-10 years has been completely ignored by this review. This must be rectified if the review is to come into line with the quickly changing energy dynamics internationally.

The Review acknowledges that disruptive technologies can facilitate the integration of unprecedented levels of renewable energy generation. Technological solutions for optimal integration exist. This is where Australia's national interest lies, and where it diverges from the interests of the energy resources industry.

The review must not repeat the mistakes we have already made in not being able to effectively plan for the changes that are coming. The draft report lists many zero emission electricity generation technologies, such as concentrated solar thermal (CST), geothermal, ocean, wave and tidal, and low emission electricity generation technologies such as biomass

[9] See ARENA 2015. Renewable Energy Options for Australian Industrial Gas Users. https://arena.gov.au/wp-content/uploads/2015/11/ITP_REOptionsForIndustrialGas_Summary_Med_FA.pdf

combustion and admits that some of these sources of electricity "provide the system benefits associated with synchronous generation." And yet, perversely, the Preliminary Report "makes no judgement on their future role."

To ignore commercially available options such as CST that does meet so many of the criteria needed to fill emerging gaps and price shocks in the electricity market renders the review useless and resigns Australia to 20th-century thinking. The cost we pay for this is the damage that expanded energy resource extraction inflicts. There is a commercially viable tender on the table now for a fully operational CST plant to provide baseload, dispatchable and reliable power to South Australia. The contribution that this project and others like it could make to resolving the problems raised in the review absolutely needs to be considered if a robust blueprint is to be developed.

Climate change

We note that two of the recent events cited by the review as highlighting the risks of the transition we are currently undergoing are related to extreme weather events. This is no coincidence. The Review of the NEM should include in its remit research that has already been undertaken into the vulnerability of Australia's energy systems to climate extremes. Distributed renewable generation and storage has the added advantage of being more adaptable to extreme weather, particularly storms and droughts, because it will not rely on corridors of high voltage power lines or large water demand.

3.1 What role should the electricity sector play in meeting Australia's greenhouse gas reduction targets?

3.2 What is the role for natural gas in reducing greenhouse gas emissions in the electricity sector?

The electricity sector is one of the largest contributors to Australia's greenhouse emissions and also one of the easiest to reduce because zero emissions alternatives are readily available. This should be a core objective of the review. We believe that the emissions from energy extraction should be included as part of the Review's consideration of this question. Though fugitive and Scope 2 emissions (and, indeed, Scope 3) from extraction and processing of coal and gas are counted separately in the official accounts, for the Review to form an accurate understanding of this question, they must be included. There is little point pretending that replacing coal power stations with gas will help us meet emissions targets if we have not considered the large increase in fugitive emissions from gas extraction that this will require along with the emissions from the power stations themselves.

A recent Melbourne Energy Institute report investigated greenhouse emissions from unconventional gas mining in Australia. It found that there is "significant uncertainty about methane emission estimates reported by oil and gas producers to the Australian Government and by the Australian Government to the United Nations." As one example, the in the United States, "methane emissions contrasts with unconventional gas developments in the United States where emissions ranging from 2 to 17% of production have been reported." The CSIRO has admitted that reliable measurements on Australian oil and gas production facilities are yet to be made.[10] Several methane measurement research projects reviewed in the MEI report indicate that Australia is likely to be substantially underreporting

[10] Quoted in Melbourne Energy Institute, 2016, http://energy.unimelb.edu.au/library/a-review-of-current-and-future-methane-emissions

emissions from production of unconventional gas. The report noted that the UN has requested Australia improve its methodologies in this area.[11]

This new information on the previously unaccounted-for fugitive unconventional gas emissions is highly relevant to the Review's blueprint, given Australia's international commitments to reduce greenhouse gas emissions. Zero emissions alternatives to gas, specifically concentrated solar thermal, storage and low cost renewables are now commercially available. The window for gas power to play a role in the transition has closed.

[11] Melbourne Energy Institute, 2016, http://energy.unimelb.edu.au/library/a-review-of-current-and-future-methane-emissions