



TWO BIRDS, ONE LITTLE BLACK ROCK

*Solving the twin problems of incentives for retirement of
coal fired generation and funding rehabilitation liabilities*

Policy Brief
Dr Richard Denniss & Rod Campbell
December 2015

The **Australia Institute**
Research that matters.



The **Australia Institute**
Research that matters.

Two birds, one little black rock

Solving the twin problems of incentives for retirement of coal fired generation and funding rehabilitation liabilities

Policy brief

Richard Denniss and Rod Campbell
December 2015

ABOUT THE AUSTRALIA INSTITUTE

The Australia Institute is an independent public policy think tank based in Canberra. It is funded by donations from philanthropic trusts and individuals and commissioned research. Since its launch in 1994, the Institute has carried out highly influential research on a broad range of economic, social and environmental issues.

OUR PHILOSOPHY

As we begin the 21st century, new dilemmas confront our society and our planet. Unprecedented levels of consumption co-exist with extreme poverty. Through new technology we are more connected than we have ever been, yet civic engagement is declining. Environmental neglect continues despite heightened ecological awareness. A better balance is urgently needed.

The Australia Institute's directors, staff and supporters represent a broad range of views and priorities. What unites us is a belief that through a combination of research and creativity we can promote new solutions and ways of thinking.

OUR PURPOSE – 'RESEARCH THAT MATTERS'

The Institute aims to foster informed debate about our culture, our economy and our environment and bring greater accountability to the democratic process. Our goal is to gather, interpret and communicate evidence in order to both diagnose the problems we face and propose new solutions to tackle them.

The Institute is wholly independent and not affiliated with any other organisation. As an Approved Research Institute, donations to its Research Fund are tax deductible for the donor. Anyone wishing to donate can do so via the website at <https://www.tai.org.au> or by calling the Institute on 02 6130 0530. Our secure and user-friendly website allows donors to make either one-off or regular monthly donations and we encourage everyone who can to donate in this way as it assists our research in the most significant manner.

Level 5, 131 City Walk
Canberra, ACT 2601
Tel: (02) 61300530
Email: mail@tai.org.au
Website: www.tai.org.au

SUMMARY

The cost to rehabilitate sites used for coal mines and coal fired power stations are large, lack transparency and are under provided for by these industries. An inquiry into the 2014 Hazelwood fire found estimated rehabilitation costs for the aging Victorian mine and power station at \$100 million. In general, the rehabilitation bonds that companies pay are far too low to cover these costs – the Hazelwood owners have posted a bond of just \$15 million.

Perversely, it is the cost of the clean-up that is prolonging the life of some mines and generators. The oldest power stations stay in operation well past their intended life. They remain operating not to make money – they often run at a loss – but to defer and avoid their rehabilitation costs. The result is excess capacity of coal fired generation delaying a transition to cleaner energy sources. In the meantime, communities and the environment bear the costs – the health impacts of the Hazelwood fire caused the partial evacuation of the town of Morwell.

Worse still, as coal companies and coal fired generators are facing difficult economic conditions, there is an increasing risk that governments and taxpayers will be left with these liabilities. Rehabilitation costs that once seemed small compared to the value of these companies are now serious liabilities. Coal major Peabody Energy, for example has lost over 95 per cent of its capital value since 2011 and has US\$2.5 billion of rehabilitation liabilities across its Australian and American mines.

Policies to address these two issues must be implemented. First, incentives need to be provided to the owners of inefficient power stations to exit the industry in an orderly and planned manner and get on with cleaning up their sites. Second, the costs of providing these incentives and of covering unfunded rehabilitation need to be secured. A solution can be found through the following policy mechanism.

- 1) Australian governments should impose a site remediation levy on all Australian coal. A levy of \$0.50 per tonne would generate over \$200 million per year.
- 2) AEMO data should be used to identify the amount of coal fired generation capacity that could be retired without imposing risks to the stability of electricity supply in each jurisdiction.
- 3) The funds collected from the site remediation levy should be directed into a fund to contribute to the costs of remediating power station sites. For example, this amount could contribute to the difference between the actual cost of rehabilitation and the amount currently held as a bond.

- 4) The funds should be distributed through a reverse auction, where generators compete as to which would accept the smallest rehabilitation subsidy to exit the industry. The auction should continue until the funds for each State have been spent or the identified capacity of coal fired generation capacity to be retired has been reached.

The policy could be extended by phasing in a fee for leaving mines and power stations mothballed for long periods. Increasing fees depending on how long an asset is in care and maintenance would provide incentive to either restart production or begin closure as well as raising money for the remediation fund.

This approach would reduce the substantial risk to taxpayers and communities of mines being left inadequately rehabilitated. It would also create jobs – rehabilitation is more labour intensive than mining or power generation - as well as reduce greenhouse gas emissions by retiring some of Australia's dirtiest generation. The scheme would be simple to administer and easy to introduce.

Costs would be borne by coal mine owners. Importantly, if previous and current mine owners had made adequate provisions for site remediation such a levy would not be necessary. The levy simply ensures that mine owners, not Australian taxpayers, meet the cost of remediating coal sites.

INTRODUCTION

Australia has 25 operating coal fired power stations and a further six that have been mothballed or decommissioned since 2012. It also has over 100 operating coal mines, as well as dozens that have been placed into 'care and maintenance'. There are an estimated 50,000 abandoned mine sites, across the country, a legacy of two centuries of mining coal and other minerals.

The process of mining and burning coal imposes a wide range of health and environmental costs on the community including air pollution, water pollution and noise pollution.¹ The Climate and Health Alliance estimate that burning coal in the NSW Hunter Valley results in \$600 million worth of health costs per annum.² The costs across Australia would, in turn, be significantly greater than the costs to just one region.

Australian governments have long accepted the costs imposed on workers and communities due to the benefits of seemingly cheap electricity and mining royalties. As renewable energy has become cheaper, alternatives now exist and Australians need not pay for cheap electricity with their health and environment. How to make this transition begin is a consistent policy problem.

One problem holding up this transition is the cost associated with coal fired power and mining site rehabilitation. Rehabilitation costs are large, sometimes hundreds of millions of dollars. These liabilities give companies a major incentive to put them off by keeping old power stations and mines running. Even if they run at a loss, this may be financially preferable to beginning the expensive process of shutting down. While companies defer closure to avoid rehabilitation liabilities, communities continue to bear the costs of coal mining and burning.

A second problem is that communities may not be the only ones bearing the costs of coal. Governments and taxpayers are also at risk of incurring huge costs if companies are unable to pay to clean up after their coal operations cease. Although most mines and power stations are required to pay bonds or provide bank guarantees to ensure there is money available to remediate their sites (in the same way that someone renting a domestic flat pays a bond) many companies have not been required to provide such bonds or to provide bonds that are much smaller than the likely liability.

¹ William Castleden et al., "The mining and burning of coal: effects on health and the environment", *The Medical Journal of Australia* 195, no. 6 (2011).

² Fiona Armstrong, "Coal and health in the Hunter: lessons from one valley for the world" (Climate and Health Alliance, 2015).

There is mounting concern that companies either cannot pay for mine rehabilitation or will try to avoid this cost.

The risk that governments and taxpayers could be left with these liabilities is becoming more apparent as a result of the financial instability of some of the world's largest coal mining companies. For example, Peabody Energy, the world's largest private coal company and with a market capitalisation in 2011 of US\$18 billion, has lost over 95 per cent of its value since then, as shown in Figure 1 below:

Figure 1: Market capitalisation of Peabody Energy



Source: Yahoo! Finance

The cost of rehabilitation may have once seemed small compared to the market size of mining and energy companies. However, over recent years, the collapse of the world coal price, the market capitalisation of coal mining companies and lower revenue available to fossil fuel generators in Australia's National Electricity Market (NEM) means that there is a real risk that companies will be unable to make good on their obligations to clean up and remediate land used for coal mining and coal-fired power stations. This problem is more advanced in the USA, where "self-bonding" rules have been a major area of political and policy re-evaluation over 2015, in parallel with the rising number of coal mining company bankruptcies.

This paper proposes a simple solution to the two problems of coal rehabilitation expenses keeping dirty power stations running and posing a risk to taxpayers.

PROBLEM 1: COAL MINE REHABILITATION IS EXPENSIVE AND BONDS HELD ARE INADEQUATE

The first problem is that coal mine rehabilitation is expensive and the bonds held by governments are inadequate to cover this cost. If the cost is not covered by the community it will be picked up by taxpayers and the community.

Rehab is expensive and communities are at risk

For example, the 2014 Hazelwood coal mine fire started on a disused part of the mine that had been ineffectively rehabilitated. The fire burned for 45 days and ultimately forced the partial evacuation of the town of Morwell. The Coronial Inquest into the fire found that GDF Suez paid an interim \$15 million rehabilitation bond in 1996 and that this figure was expected to be increased at a later date to reflect the actual cost of both ongoing remediation work and end of life costs.³ Despite the fact that GDF Suez sought, and was granted, numerous modifications to its mining license the size of the rehabilitation bond was never increased by the Victorian Government. The Coronial Inquest found that an adequate bond would be in the order of \$100 million.

Another Victorian coal mine owned by Alcoa has recently suggested that it will cost \$55 million to remediate the site. This mine and associated power station at Anglesea is a far smaller site than Hazelwood and many mines around the country.⁴

It is estimated that there are around 50,000 abandoned mine sites in Australia, including many dating back to the 1800s.⁵ If companies are not required to post bonds that are sufficient to cover the entire costs of site remediation then the costs fall on the Australian taxpayer or environment. Just as the law requires tenants to leave a property in good condition, or pay for its repair, the law requires the same of mining companies.

Dr Peter Erskine of the University of Queensland's Sustainable Minerals Institute estimates that the cost of rehabilitating mines in Queensland and NSW is up to 10 times greater than the value of rehabilitation bonds held by Governments. Dr Erskine cites the Queensland Auditor General who found in 2014 that mine remediation bonds were "insufficient to cover the cost of rehabilitation" and that in one case the bond

³ Hazel wood Mine Fire Inquiry, "Hazelwood Mine Fire Inquiry Report" (2014).

⁴ Danny Lannen, "Alcoa Anglesea: Mine clean-up and rehabilitation to cost \$55 million", *Geelong Advertiser*.

⁵ Corinne Unger, "What should we do with Australia's 50,000 abandoned mines?", *The Conversation*.

held by the government was equivalent to only 1.5 per cent of the estimated rehabilitation cost.⁶

Put simply, Australian taxpayers are at risk of huge liabilities if we allow coal mining companies and coal fired power stations to exit the industry without paying to clean up the damage they have done.

PROBLEM 2: REHABILITATION EXPENSES DELAY RETIREMENT OF DIRTY POWER STATIONS AND MINES

Many coal fired power stations and mines are operating well beyond their planned life. Not only are they polluting and inefficient, but many are currently losing money and shareholder value.

Power stations

Despite the old age of many coal fired power stations and the low returns currently being received by some power station owners, the need to pay for site remediation on closure provides a significant incentive to keep power stations either in operation or in the 'care and maintenance' phase.

Put simply, the need to tidy up after themselves has created an incentive for polluters to keep the party going.

According to the Australian Energy Market Operator (AEMO) the Australian electricity market currently has significant excess capacity both across the entire National Electricity Market (NEM) and within individual regions. Table 1 shows that AEMO also expects that this situation will continue until at least 2023-24. For each state in the NEM there is at least one relatively old coal fired power station which, if retired, would not result in a shortage of electricity generation capacity in either the short term or over the next decade.

⁶ Lisa Main and Dominique Schwartz, "Industry insider warns taxpayers may foot bill for mine rehabilitation unless government, industry step up", *ABC News*.

Table 1: Levels of surplus generating capacity by NEM by State (MW)

State	2014-15	2023-24	Oldest coal plant	Commissioned	Capacity of oldest plant
QLD	2,200 – 2,850	1,100 – 3,650	Gladstone	1976 – 1982	1,710
NSW	2,800 – 3,100	1,500 – 3,450	Liddell	1971 – 1973	2,200
VIC	1,950 – 2,200	1,450 – 3,100	Hazelwood	1964 – 1971	1,760
SA	550 – 600	350 – 1,050	Northern	1985	540

Source: AEMO, “Electricity Statement of Opportunities for the National Electricity Market” (August 2014). Note that more closures are proposed during this period, but are difficult to confirm at time of writing.

Retiring coal fired power stations will result in a significant reduction in Australia’s greenhouse gas emissions, significantly reduce particulate and other forms of pollution and create new opportunities for the expansion of renewable energy over time.

Coal mines

A similar situation now exists in the coal mining industry more generally. Coal prices are close to a decade low, but rather than closing, a growing number of mines are placed into ‘care and maintenance’, deferring their rehabilitation liabilities indefinitely (Table 2).

Table 2: Examples of mines not producing but not being rehabilitated

Name of mine		Status	Date
Wollongong Coal	NSW	Care and Maintenance	September 2015
Isaac Plains	Qld	Care and Maintenance	September 2014
Angus Place	NSW	Care and Maintenance	September 2014
Ravensthorpe underground	NSW	Care and Maintenance	September 2014
Invincible Colliery	NSW	Care and Maintenance	2013
Cullen Valley Colliery	NSW	Care and Maintenance	2013

Baal Bone	NSW	Not producing, staying open as a 'training mine'	2012
Blair Athol	Qld	Care and Maintenance	2012
Gregory	Qld	Care and Maintenance	2012

As with the coal fired power stations, coal mines may prefer to continue to operate or to place themselves into 'care and maintenance' rather than exit the industry as a means to avoid having to meet their rehabilitation liabilities. Dr Peter Erskine argues that in the last 33 years no mines have 'closed' in Queensland and that less than 10 per cent of mines placed into 'care and maintenance' had been rehabilitated in any way.⁷

The current system of regulations rewards inaction and provides mining and electricity generation companies with an incentive to either postpone, or avoid, their legal obligations to remediate their sites. Such delay in remediation:

- Increases environmental harm
- Increases the risk that the remediation work will never be paid for by the companies that caused the harm
- Distorts the coal and electricity market by keeping output at an inefficiently high level

In essence, the electricity generation sector is seeing the owners of coal fired power stations engage in a lengthy and expensive game of brinksmanship. While the first generator to leave the industry has to pay their remediation costs straight away, those who stay both delay incurring those costs and benefit from the likely higher electricity price that will accompany a reduction in electricity generating capacity. The result is a risky, expensive, emission intensive and inefficient standoff where the decision makers will act solely in terms of their private corporate capacities with little regard for the Australian national interest.

THE SOLUTION

To end this standoff two things must be achieved. Firstly, adequate funding for mine site rehabilitation needs to be secured while the operators are still mining or

⁷ Lisa Main and Dominique Schwartz, "Industry insider warns taxpayers may foot bill for mine rehabilitation unless government, industry step up", *ABC News*.

generating electricity. Secondly, incentives need to be provided to the owners of inefficient mines and power stations to exit the industry and get on with cleaning up their sites. A solution can be found through the following policy mechanism.

- 1) Australian governments should impose a site remediation levy on all Australian coal. Based on last year's coal production such a levy of \$0.50 per tonne would have generated over \$200 million. Such a levy could be imposed as an export licence by the federal government or collected by state governments as a supplementary royalty.
- 2) AEMO's Statement of Opportunities should be used to identify the coal-fired generation that could be safely removed from each NEM region without imposing risks to the stability of supply.
- 3) In order to provide an incentive for inefficient mines and generators to exit the industry rapidly, the funds collected from the site remediation levy should be directed into a fund to contribute to remediating power station sites.
- 4) The funds should be distributed through a reverse auction, where generators compete as to which would accept the smallest rehabilitation subsidy to exit the industry. The auction should continue until the funds for each region have been spent or the identified capacity of coal fired generation capacity to be retired has been reached.
- 5) Any excess funds from the site remediation levy could then be used to begin repairing abandoned coal mines.

When choosing the successful bidder in the reverse auction the government should consider a number of criteria. This includes stability of supply, cost per MW of retired electricity, the age of the power station and cost per tonne of abatement. This will ensure that the government gets value for money as well targeting older higher emissions power stations.

An independent inquiry into the cost of rehabilitating all abandoned mines and the likely future costs of fully rehabilitating existing mine sites should also be held. Having identified the likely cost of rehabilitating all mine sites such an inquiry could also investigate the benefits of broadening the base of the rehabilitation levy beyond coal to other minerals.

There is a risk that the additional levy would provide incentive for marginal mines to go into care and maintenance. Additional incentives should be provided to bring mines out of mothballs or to begin their closure and remediation. This could take the form of

penalties for leaving mines in care and maintenance, with increasing penalties over time, with money directed to the rehabilitation fund.

THE BENEFITS

In addition to reducing the financial obligation of Australian governments to remediate the damage done by coal mining the imposition of such a levy and buyout of surplus coal fired power stations would:

- 1) Create jobs. Mine rehabilitation is far more labour intensive than coal mining or coal fired power generation and would create thousands of new jobs requiring a similar skill-set to that of the growing number of unemployed ex-coal miners.
- 2) Reduce greenhouse gas emissions. Coal-fired power is the most emissions intensive power and retiring any will reduce emissions. The policy should ideally be further refined to target the oldest, dirtiest generators.
- 3) The scheme would be simple to administer and quick to introduce.

THE COSTS

The introduction of a remediation levy would lead to a slight (\$0.50) reduction in the per tonne profits received by the owners of coal mines in Australia, most of whom are foreign investors. However, if previous and current mine owners had made adequate provisions for site remediation such a levy would not be necessary. Australian mining history is a constantly reoccurring lesson that appropriate corporate action should not be assumed. The levy simply ensures that mine owners, not Australian taxpayers, meet the cost of remediating coal sites.

Some generators may be able to pass some of this cost on to electricity consumers. However, given that generation costs are only around one third of retail prices, current abundant supply and the small size of the levy, any increase in retail prices will be small.

It is important to place the cost of the remediation levy into context. Despite the current low coal prices and recent reductions in demand for coal from China, the Australian mining industry remains keen to significantly increase coal exports via large new mines in New South Wales and Queensland. The scale of these proposed new coal mines is such that, if they were to begin exporting, they would push the world price of coal down by significantly more than \$0.50. Put simply, if the coal industry is threatened by the introduction of a modest levy then it should be far more concerned

with their own industry's plans to increase Australian exports of coal by up to 100% in the coming decade.

CONCLUSION

Someone will have to pay for the remediation of Australian coal mines and coal fired power stations. Attempts to conceal, avoid or delay meeting such obligations does nothing to diminish them.

The introduction of a modest levy on coal production would rapidly provide a large pool of funds that can be used to meet the liabilities associated with abandoned mines, smooth the exit of excess coal fired power generation capacity and create a significant number of jobs in site remediation.

Rather than subsidise the construction of new coal mines which are large enough to push the world price of coal down by more than \$0.50 Australian governments should redirect those funds to the development of low emission sources of energy and transport while requiring the coal industry to fund the repair of the damage it has done.

Bibliography

ABC News. 12 May 2015. *Alcoa to close Anglesea power station, coal mine after failing to find buyer*. <http://www.abc.net.au/news/2015-05-12/alcoa-to-close-anglesea-power-station-coal-mine/6462598?source=rss>.

AEMO,. "Electricity Statement of Opportunities for the National Electricity Market". August 2014.

Armstrong, Fiona. "Coal and health in the Hunter: lessons from one valley for the world". Climate and Health Alliance 2015.

Arup, Tom. "Senate inquiry calls for new national rules to curb windfarms". *SMH*. August 3 2015 <http://www.smh.com.au/federal-politics/political-news/senate-inquiry-calls-for-new-national-rules-to-curb-wind-farms-20140430-zr271.html>.

Castleden, William, David Shearman, George Crisp, and Philip Finch. "The mining and burning of coal: effects on health and the environment". *The Medical Journal of Australia* 195, no. 6 (2011): 333-335.

Hazelwood Mine Fire Inquiry. "Hazelwood Mine Fire Inquiry Report". 2014.

Jamasmie, Cecilia. "Glencore slashes Australian coal production". *Mining.com*. February 27 2015 <http://www.mining.com/glencore-slashes-australian-coal-production-37195/>.

Lannen, Danny. "Alcoa Anglesea: Mine clean-up and rehabilitation to cost \$55 million". *Geelong Advertiser*. May 15 2015 <http://www.geelongadvertiser.com.au/news/geelong/alcoa-anglesea-mine-clean-up-and-rehabilitation-to-cost-55-million/story-fnjuhovy-1227356109541>.

Main, Lisa, and Dominique Schwartz. "Industry insider warns taxpayers may foot bill for mine rehabilitation unless government, industry step up". *ABC News*. September 19 2015 <http://www.abc.net.au/news/2015-09-19/taxpayers-may-foot-bill-for-mine-rehabilitation/6787954>.

Malicdem, Darwin. "Debate on negative effects of wind turbines in Australia to health rages". *International Business Times*. July 2015

SBS. 11 June 2015. *Wind farms 'visually awful' have 'potential health impact': Abbott*. <http://www.sbs.com.au/news/article/2015/06/11/wind-farms-visually-awful-have-potential-health-impact-abbott>.

Unger, Corinne. "What should we do with Australia's 50,000 abandoned mines?". *The Conversation*. July 23 2014 <https://theconversation.com/what-should-we-do-with-australias-50-000-abandoned-mines-18197>.

