

# Mind the gaps

## Unused capacity and unfunded rehabilitation in Upper Hunter coal mines

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*Existing mines in NSW's Upper Hunter region are approved to mine 241 million tonnes per year, but mined just 150 million tonnes in 2019/20. The difference of 91.5 million tonnes shows that there is no need for new coal projects in the state. Filling in the Upper Hunter's final voids would cost between \$12 billion and \$25 billion, while the NSW Government holds just \$3.3 billion in environmental bonds for all mines in the state.*

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# Summary

The rationale for new coal mines in NSW is undermined by the fact that existing coal mines are producing at well below their approved capacity. The 16 Upper Hunter mines, or mining complexes, are approved to produce a total of 241 million tonnes of 'run of mine' coal each year, but produced just 150 million tonnes in 2020, a gap of 91 million tonnes. In other words, Upper Hunter mines are currently operating at less than two thirds (62%) of approved capacity.

Furthermore, Hunter Valley coal sales peaked in 2014. While 2020 saw an increase on 2019, sales were still below 2013 levels according to recent data from the NSW Department of Planning, Industry and Environment.

Any new mines approved in such circumstances will either similarly operate below capacity, under-delivering on claimed economic benefits, or exacerbate the production gap at existing mines through competition. Either way there is no justification for new mines without an overall strategy that considers the combined future of the Hunter's mines in a coal market affected by climate policy and cheaper alternative forms of energy.

The mines in the Upper Hunter have approval to leave behind 23 huge holes, known as final voids. These voids affect groundwater and often fill with highly saline or otherwise unusable water.

These approvals are not in step with community expectations around mine site rehabilitation. Polling by The Australia Institute found that 77 percent of Australians expected voids to be filled to "near original surface level with groundwater protected". Less than 1 percent of respondents felt that it was acceptable for "pits [to] remain and fill with saline or acidic groundwater."

The voids were approved on the basis that filling them in would cost mining companies too much money. Four Upper Hunter mines have published the cost of filling in their voids, with estimates ranging between \$526 million and \$2.1 billion.

Based these estimates, if current or future generations wanted to fill in the Upper Hunter's voids, the total cost would range between \$11.5 billion and \$25.3 billion. The NSW Government currently holds just \$3.3 billion in bonds to meet current rehabilitation liabilities for not just the Upper Hunter, but all mines in the state.

# Introduction

Despite the urgent need for climate action necessitating a global reduction in the production and consumption of coal, proposals for new coal projects in NSW are increasing rather than decreasing. Eleven new proposals were added to a federal government list in 2020, substantially more than in recent years.<sup>1</sup>

The case for new mines is weakened not only by the need for climate action, but also by the actions of the Hunter coal industry. The Port of Newcastle has abandoned plans to expand its export capacity above 200 million tonnes per year and the coal rail network has also revised down its capacity requirements.<sup>2</sup> Perhaps most tellingly, the Hunter's existing mines are operating well below their full capacity. With so much spare capacity, there is simply no need for new coal mining projects.

Another key issue is how to address the huge final voids that will be left behind after the Hunter's mines close. While leaving huge voids may be in line with existing legal obligations, whether the landscape left behind meets current and future community needs is another question. In 2016, polling by The Australia Institute found that 77 percent of Australians expected mine sites to be fully rehabilitated, described as:

Rehabilitation close to previous natural or farming condition -pits refilled to near original surface level, groundwater protected and original types of vegetation replanted.

Less than 1 percent of respondents felt that it was acceptable for “pits [to] remain and fill with saline or acidic groundwater, dirt and rock piles remain in a fenced off area.”<sup>3</sup> Yet this is exactly what has been approved. It appears there is a substantial gap between the standard of site rehabilitation required by the NSW Government and the standard that the public expects. With this in mind, it is worth comparing the bonds held by the Government for “full cost of rehabilitation” to the cost of filling in voids in line with public expectation.

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<sup>1</sup> Denniss, Campbell and Littleton (2021) *One Step Forward, Two Steps Back: New coal mines in the Hunter Valley*, <https://australiainstitute.org.au/report/one-step-forward-two-steps-back/>

<sup>2</sup> Ibid

<sup>3</sup> Campbell (2016) *Public opinion on mine site rehabilitation*, <https://australiainstitute.org.au/report/public-opinion-on-mine-site-rehabilitation-briefing-note/>

# Production gap

The Australia Institute has analysed coal mine production figures in the Upper Hunter based on publicly available records, and compared that volume against the approved limits. Our research has found that there is an estimated 91.5 million tonne per year shortfall in production by existing coal mines, as shown in Table 1 below:

**Table 1: Upper Hunter coal mines: Approved volumes vs latest year production**

Mine	Approved annual coal production (Million tonnes, run of mine)	2019/20 production (Million tonnes, run of mine)	Difference
Hunter Valley Operations	42	16.9	25.1
Mt Arthur	32	21.3	10.7
Mt Thorley-Warkworth	28	17.6	10.4
Ravensworth Complex	21	14.9	6.1
Bengalla	15	12.6	2.4
Mt Owen Complex	18.5	12.8	5.7
United-Wambo	14.7	8.0	6.7
Mangoola	13.5	9.4	4.1
Bulga	12.2	10.1	2.1
Mt Pleasant	10.5	10.4	0.1
Ashton Complex	5.5	2.0	3.4
Liddell	8	5.7	2.3
Dartbrook	6	0	6.0
Integra	4.5	2.8	1.7
Rix's Creek	8.1	4.4	3.7
Muswellbrook	2	1.2	0.8
<b>Total</b>	<b>241</b>	<b>150.0</b>	<b>91.5</b>

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Sources: Annual reports on mine websites, NSW Major projects register. See appendix for more detail

Note: Where available, production data from 2020 was used. See appendix for details. Where no 2020 data was publicly available, 2019 data was used. Figures may be affected by rounding.

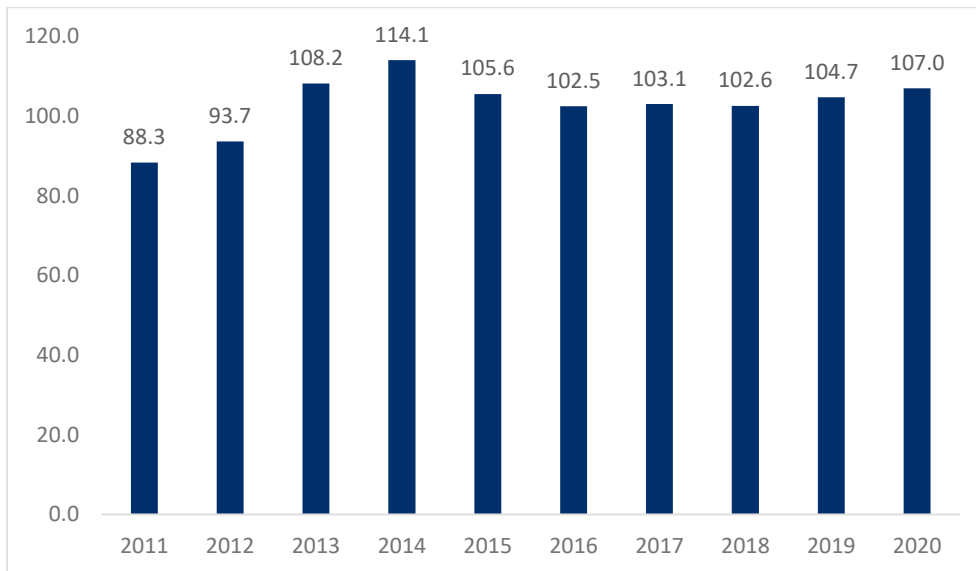
Table 1 shows that while some mines are close to their approved capacity, there are significant production gaps for most, including Yancoal's massive Hunter Valley Operations complex which, at 16.9 million tonnes in 2020 was 25.1 Mtpa shy of its production limit of 42 Mtpa.

Collectively, the production gap of 91.5 Mtpa is almost as large as the 98 Mtpa of new coal projects currently proposed for the Upper Hunter.<sup>4</sup>

<sup>4</sup> Ibid

Table 1 refers to 'run of mine' or raw coal. The volume of processed coal is lower, but is usually not provided in company reporting on a mine-by-mine basis. The NSW Government recently provided data on overall Hunter coal production, at the request of the NSW Independent Planning Commission. The chart produced by the Department of Planning, Industry and Environment (DPIE) is reproduced in Figure 1 below:

**Figure 1: Total saleable coal production in the Hunter Valley (2011-2020)**



Source: DPIE (2021) Response to IPC question on notice regarding Mangoola Coal Continued Operations Project

Figure 1 shows that Hunter Valley coal production peaked in 2014 and despite an increase in 2020, sales remained below 2013 levels.

# Rehabilitation gap

The NSW Government holds around \$3.3 billion in security bonds paid by mining companies to “cover the full cost of all rehabilitation and mine closure activities required if a mining company defaults on their rehabilitation obligations.”<sup>5</sup> This refers to the companies’ obligations under existing approvals, which, in the case of the large coal mines in the Upper Hunter, usually includes leaving large holes behind, known as “final voids”. Voids have a huge impact on groundwater and many fill with water that is highly saline or otherwise unusable.

Table 2 below presents basic information around the Hunter’s mines and likely final voids:

**Table 2: Upper Hunter coal mines and likely voids**

Mine	Number of final voids	Size of voids (hectares)
Hunter Valley Operations	2	440
Mt Arthur	3	700
Mt Thorley-Warkworth	2	880
Ravensworth Complex	3	180
Bengalla	1	270
Mt Owen Complex	1	240
United-Wambo	2	484
Mangoola	1	79
Bulga	1	550
Mt Pleasant	1	105
Ashton Complex	1	37
Liddell	2	170
Dartbrook	Underground	NA
Integra	1	120
Rix's Creek	1	140
Muswellbrook	1	62
<b>Total</b>	<b>23</b>	<b>4,457</b>

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Sources: Walters (2016) *The hole truth: The mess coal companies plan to leave in NSW*; Environmental reports on mine websites, NSW Major projects register, NSW Resources Regulator.

When applying for planning approval, mines typically argue to be able to leave voids because filling them in would cost too much money and occasionally estimates of this cost

<sup>5</sup> NSW Resources Regulator (2021) *Rehabilitation*, <https://www.resourcesregulator.nsw.gov.au/environment/rehabilitation>

are included in planning documents. Four Upper Hunter mines have published such estimates, including the United Wambo project, which stated:

The cost to backfill both voids inclusive of all costs associated with material movement, rehandling, rehabilitation, drainage infrastructure, maintenance and production staff and overheads was \$777 million. This equates to \$7.0 million per ha for the additional land area gained from backfilling the voids.<sup>6</sup>

Other published estimates are not expressed in per hectare terms – obviously the cost per area finally reclaimed depends on the depth of the void and availability of material – but a range of estimates can be derived:

**Table 3: Published estimates of void area and filling costs**

Mine	Estimated cost (\$ millions)	Hectares	\$millions/hectare
<b>Mt Thorley-Warkworth</b>	2,085	880	2.37
<b>Mangoola</b>	526	79	6.66
<b>Mt Pleasant</b>	1,000	105	9.52



Sources: see appendix

Based on void filling costs of between \$2.37 million per hectare, as suggested by the Mt Thorley-Warkworth assessment, and the \$7 million per hectare, as stated by the developers of United Wambo, a basic estimate of the cost of filling in the Upper Hunter’s 4,457 hectares of voids can be derived. The lower end would be \$11.5 billion, the upper end \$25.3 billion.<sup>7</sup>

It is clear that the current rehabilitation bonds held are not adequate to even begin addressing the Upper Hunter’s voids should current or future generations want to.

<sup>6</sup> Glencore & Peabody (2018) *United Wambo Open Cut Coal Mine Project: Response to Independent Planning Commission Recommendations*, page 62.

<sup>7</sup> For the four mines with a published cost to fill voids, that cost is used in both high and low estimates. The remaining cost is estimated by applying the high and low per hectare costs to estimated void areas.



# Conclusion

The Australia Institute has called for a moratorium on new coal mines in NSW, a call backed by former Prime Minister Malcolm Turnbull. The current gap in production between approved limits and actual yearly production shows that current operations are either unable or unwilling to meet production limits.

New South Wales' security bond system currently holds just a fraction of the estimated cost of properly backfilling and rehabilitating the final voids that will be left by coal mines in the Upper Hunter.

Further coal projects in the Upper Hunter are not only unnecessary – they are economically detrimental to existing operations. A moratorium on new coal mines should be adopted by the NSW Government.

# Appendix

Data on production levels for each mine was sourced from the NSW Major Projects register and from publicly available documents provided by mine operators.

Where public data was not available for 2020 production volumes, data from 2019 was used in its place, or in limited cases a 2020 forecast was used and compared against coal train tonnage reporting for accuracy.

Security bond data was accessed from the NSW Resources Regulator. The number of voids and size was accessed via the company reporting documents and/or NSW Major Projects. Where no data was available on the estimated cost to fully backfill and rehabilitate final voids, the cost was estimated based on a formula provided by Glencore in response to Independent Planning Commission recommendations that found that each hectare would cost \$7 million to backfill and rehabilitate.

## SOURCE LIST

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