A large yellow coal truck is shown from a low angle, filled with dark coal. It is positioned in front of a vast landscape of rolling hills and mountains under a clear sky.

# SEEING THROUGH THE DUST: COAL IN THE HUNTER VALLEY ECONOMY

JUNE 2014  
RODERICK CAMPBELL

The Australia Institute  
Research that matters.



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# **Seeing through the dust: Coal in the Hunter Valley economy**

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## Summary

The Hunter Valley produces and exports large volumes of coal. Supporters of the industry portray it as a ‘vital economic engine room’ and ‘the bedrock of the Hunter’s economy’. In contrast to coal proponents’ claims, however, economic profiles of the region emphasise that the Hunter has a diversified, modern economy, without any one dominant sector, and that the service sectors are the major employers.

The coal industry’s public statements invariably emphasise its apparent economic importance. Claims are usually made in absolute terms – tonnes of coal, numbers of jobs, total royalties paid and so on. But when the industry is placed in context we see that:

- Only five per cent of Hunter Valley jobs are in the coal industry – in other words, 95 per cent of Hunter workers do not work in the coal industry.
- Only two per cent of NSW government revenue comes from coal royalties – the other 98 per cent comes from other sources.

The coal industry’s regular economic claims give the public an inflated impression of its importance. To investigate the difference between public perception and the reality of the industry’s role in the Hunter economy, The Australia Institute conducted a survey of 1,001 Hunter residents. Key results indicate that:

- respondents think the coal industry employs four times more people than it does
- respondents think coal royalties are ten times more important than they are
- strong majorities of respondents answered that the coal industry has a negative effect on the Hunter’s:
  - air quality and health
  - water and bushland
  - other industries.

Even though survey respondents had a heavily inflated impression of the coal industry’s economic importance, only a minority – 37 per cent – felt that the industry’s economic contribution outweighed the other costs it imposed on the community. Eighty-three per cent of Hunter residents do not want to see the industry expand, while 41 per cent would like to see it decrease or be phased out.

A smaller coal industry would have only minor impacts on the future Hunter economy. According to economic modelling commissioned by Regional Development Australia – Hunter, long-term adverse conditions for the coal industry would have minimal effect on employment (zero to 1.2 per cent) and minor impacts on economic output (0.2 to four per cent).

The people of the Hunter Valley – and NSW decision makers – should realise that an ever-expanding coal industry is not essential to the economic future of the Hunter. Stopping the expansion of the Hunter coal industry and beginning to reduce its output levels will not cause widespread unemployment or problems for state finances – it would, in fact, be likely to improve air quality, health and environmental impacts and bring benefits for other industries.

## Introduction

The Hunter Valley is well known to most Australians for its major city, Newcastle, its wineries and its coal mines. Almost 600,000 people live in the region, with 343,000 living in the Newcastle and Lake Macquarie urban areas and 243,000 more in the wider area.<sup>1</sup> The Hunter is a popular tourism destination and home to a range of agricultural, manufacturing and service industries. Recent economic assessments of the Hunter reflect this and place emphasis on the diversity of the region's economy:

*[In] employment at least, overall the Hunter region has prospered over the last decade or so. Consistent with contemporary economic trends, the service sector is on the rise, including health care and social assistance, accommodation and food services and education. But so too are the more traditional areas of manufacturing and mining.<sup>2</sup>*

*As a starting point, the Hunter has a solid base to flexibly absorb and respond to emerging economic circumstances. For instance, it has a relatively diverse economic base, a considerable pool of skilled workers and offers important lifestyle benefits and natural attractions.<sup>3</sup>*

*The structural change in the region and the increasing employment in some industries, for instance in health care and social assistance and education and training, contributed to both a higher degree of diversification and a declining unemployment rate in the Hunter. Compared to past periods, the economy is a lot more diversified today and, therefore less vulnerable to future shocks and economic cycles.<sup>4</sup>*

It is the coal mining industry, however, which is often portrayed as the “vital economic engine room” of the Hunter and the wider NSW economy.<sup>5</sup> In contrast to the above assessments from economists, coal industry advocates – both lobbyists and politicians – rarely let an opportunity pass to claim the industry’s economic importance:

*Coal mining continues to form the bedrock of the Hunter’s economy ...*

*Coal mining in the Hunter is vital to the continued strength of the state’s economy ...<sup>6</sup>*

*[Coal mining is] an industry that this state cannot do without.<sup>7</sup>*

*The mining industry is fundamental to the success of the NSW economy and achieving the NSW Government’s economic targets.<sup>8</sup>*

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<sup>1</sup> ABS 2011 census, accessed through Tablebuilder. Throughout this report the Hunter Valley is defined as ABS Statistical Areas SA4 106 Hunter Valley ex Newcastle and SA4 111 Newcastle and Lake Macquarie. These areas include the Local Government Areas of Cessnock, Dungog, Lake Macquarie, Maitland, Muswellbrook, Newcastle, Port Stevens, Singleton and Upper Hunter. Note that many reports have slightly varying geographical definitions of the Hunter Valley.

<sup>2</sup> Wilkinson (2011) *The Hunter Region : An Economic Profile*, p11

<sup>3</sup> Deloitte Access Economics (2013) *Prospects and challenges for the Hunter region: A strategic economic study*, pviii

<sup>4</sup> HVRF (2011) *Diversification of the Hunter Economy – Post BHP*, p13

<sup>5</sup> Heber (2013) *Mining has a positive impact on the Hunter economy: KPMG*

<sup>6</sup> RDA Hunter (2013) *Hunter investment prospectus 2013*, p20

<sup>7</sup> Validakis (2013) *More needs to be done to protect NSW mining : Galilee*

<sup>8</sup> NSW Minerals Council (2013c) *SUBMISSION: Progressing the NSW Economic Development Framework October 2013*, p4

The perception that the Hunter coal industry is vital to the NSW economy gives the industry great political power. For example, in 2013 the industry lobbied for, and quickly won, changes to NSW legislation when the Land and Environment Court overturned a coal project's approval.<sup>9</sup> Similarly, miners were successful in lobbying for the de-funding of the environmental law centre, EDO NSW, following the organisation's representation of community and environment groups opposed to coal projects.<sup>10</sup>

The industry's political successes are invariably based on its perceived role in the Hunter and NSW economies. For example, a submission to the NSW government last year by the NSW Minerals Council begins by claiming:

*Mining underpins regional economies across the state and has significant flow on benefits to other industries. The NSW mining industry:*

- *Directly spent over \$12.8 billion on goods and services, wages and salaries, local government payments and community contributions in NSW during 2012/13*
- *Supports over 10,500 businesses throughout NSW*
- *Is the state's largest export industry (by value)*
- *Employs 53,745 people*
- *Generated \$1.3 billion in royalties in 2012-13, with \$7.4 billion forecast over the next four years<sup>11</sup>*

These claims are true. But without placing them in the context of the wider economy, the unwary reader has little way of knowing how to judge their importance. This report seeks to contextualise the role the mining industry plays in the Hunter and NSW economy. These claims are examined later in this report and, when placed in perspective, shown to be not nearly so important as they first appear.

To gain a better understanding of how such claims influence the public perception of the Hunter coal industry, we commissioned a poll of 1,001 Hunter Valley residents. Residents were asked for their impressions of:

- mining employment
- royalties and their importance to government finances
- mining's impacts on and mitigation measures for:
  - air quality and health
  - other industries
  - water and bushland
- whether mining's benefits outweigh its negative impacts
- the Hunter mining industry's level of foreign ownership
- preferences for the future of the Hunter coal industry

A full copy of the questionnaire is provided in the appendix. A professional polling company conducted the poll using voice-automated telephone interviewing and random-digit dialling to numbers known to be within the Hunter Valley and Newcastle. Demographic data was also obtained, and after the interviews were completed, the responses were weighted against population estimates derived from the 2011 Census.

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<sup>9</sup> Lagan (2013) *NSW Government Will Reconsider FOI Request In Bulga Case*

<sup>10</sup> Kelly (2013) *Environmental Defenders' cash threat*; Milman (2013) *Coalition cuts all government funding to environmental legal aid centres*

<sup>11</sup> NSW Minerals Council (2013c) p6

The results of the polling suggest that the mining industry's regular public statements and commissioned reports are effective in inflating public opinion of the industry's economic influence. Despite these inflated impressions, residents feel that the costs on environmental and health issues outweigh the economic benefits of the industry – the vast majority would like to see Hunter mining restricted to current levels or reduced.

We hope to explain the divergence between the economic claims of the mining industry and the analysis of other researchers who emphasise the diversity and strength of the Hunter economy. In essence, while a large volume of coal is produced in the Hunter, it is clear that the industry is a modest contributor to employment, Hunter businesses and government revenues. While a major exporter, the industry is largely foreign owned and claims that the industry is 'vital' to the state are overstated.

A better understanding of the role of mining in the Hunter and NSW economy is important at a time when it is expanding in ways that have a strong impact on communities, other industries and the environment. Some expansion proposals have a major local impact, but can be marginal to the economics of the particular project and the industry overall. Despite this, approval is urged by the industry on the basis of the size of the entire industry in absolute terms. When seen in context, not only are the proposals marginal but the industry itself plays a modest role in the wider economy.

Assessment of many coal proposals have shown that the claimed benefits do not outweigh the costs, a sentiment shared by many poll respondents. Furthermore, in a carbon-constrained world, both the Hunter and the wider community need to reduce coal use. What this report shows is that rejecting controversial proposals and ultimately reducing the size of the Hunter coal industry will have minimal economic impact overall and will provide benefits for many stakeholders.

## **Perception versus the reality of the Hunter coal industry**

### **Volume**

There is no doubt that the Hunter coal industry is big when assessed by volume. The Hunter and Newcastle coalfields produce over 100 million tonnes of saleable coal per year.<sup>12</sup> This is around two thirds of NSW production (157 million tonnes) and 30 per cent of Australia's black coal production.<sup>13</sup>

In addition to coal produced in the Hunter and Newcastle coalfields, coal from further afield is transported through the Hunter Valley and shipped from the Port of Newcastle. Shipping over 140 million tonnes in 2012-13,<sup>14</sup> Newcastle is the largest coal export port in the world, larger than Queensland's largest export port, Hay Point, which ships 90 million tonnes per year.<sup>15</sup> The amount of coal shipped through Newcastle Port in one year is enough to fill the Melbourne Cricket Ground eighty times,<sup>16</sup> or to make a band of coal one metre high and three and a half metres wide that would stretch all the way around the earth.

Most of this coal is burned to generate electricity. Burning coal is one of the most carbon intensive ways to generate electricity and these carbon emissions are a major contributor to climate change. Burning a tonne of Hunter Valley coal generates around 2.4 tonnes of

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<sup>12</sup> NSW Trade & Investment (2013) *2013 NSW Coal industry profile*

<sup>13</sup> BREE (2012) *Resources and Energy Statistics 2012*

<sup>14</sup> Newcastle Port Corporation (2013) *Trade Statistics*

<sup>15</sup> Eadie (2013) *Too Many Ports in a Storm: The risks of Queensland's port duplication*; NQBPC (2014) *Hay Point Port*

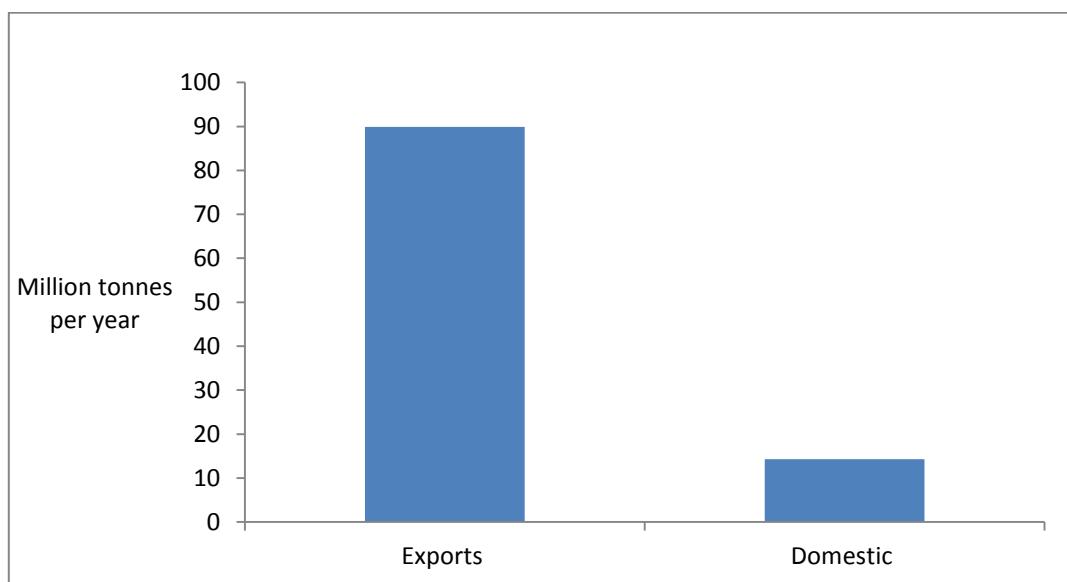
<sup>16</sup> MCG (n.d.) *MCG Facts and Figures*

carbon dioxide equivalent, meaning that the coal exported through Newcastle generates around 334 million tonnes of emissions.<sup>17</sup> To put this in context, Australia's entire greenhouse gas emissions in 2012-2013 from all sources was recorded as 557 million tonnes.<sup>18</sup>

## Sales and exports

The vast majority of the Hunter's coal is exported. As we see in Figure 1 below, power stations in the Hunter use less than 20 million tonnes per annum (Mtpa), leaving around 90 million tonnes to be exported. Because of the industry's export focus, changes to the Hunter coal industry have minimal impact on the availability or price of electricity in NSW.

**Figure 1: Hunter and Newcastle coalfield exports and domestic consumption**



Source: (NSW Trade & Investment, 2013).

These large quantities of coal sell for seemingly large amounts of money. At an average export price of \$116 per tonne,<sup>19</sup> coal produced in the Hunter and Newcastle coalfields is valued at over \$12 billion per year. NSW Minerals Council chief Stephen Galilee puts this into context:

*Contrary to many misconceptions, mining is actually a relatively small industry in NSW, responsible for only 2.5 per cent of Gross State Product.<sup>20</sup>*

As much of NSW mining takes place in the Hunter, the portion of regional output from mining there is higher. Deloitte Access Economics (DAE) estimates that the coal industry accounts

<sup>17</sup> Calculation based on conversion factors of bituminous coal in Department of Climate Change (2013a) *Australian National Greenhouse Accounts: National Greenhouse Accounts Factors*

<sup>18</sup> Department of Climate Change (2013b) *Australian National Greenhouse Accounts: Quarterly Update, March Quarter 2013*

<sup>19</sup> NSW Trade & Investment (2013) average price for exports in 2010-11, the latest year published in that publication, prices have since fallen.

<sup>20</sup> Galilee (2012) *Mining supporting our coal communities*, although ABS (2013a) 2012-13 *State accounts*, suggests the figure is closer to three per cent.

for nearly a quarter of the Hunter region's output, although estimating the production of small regions is difficult.<sup>21</sup>

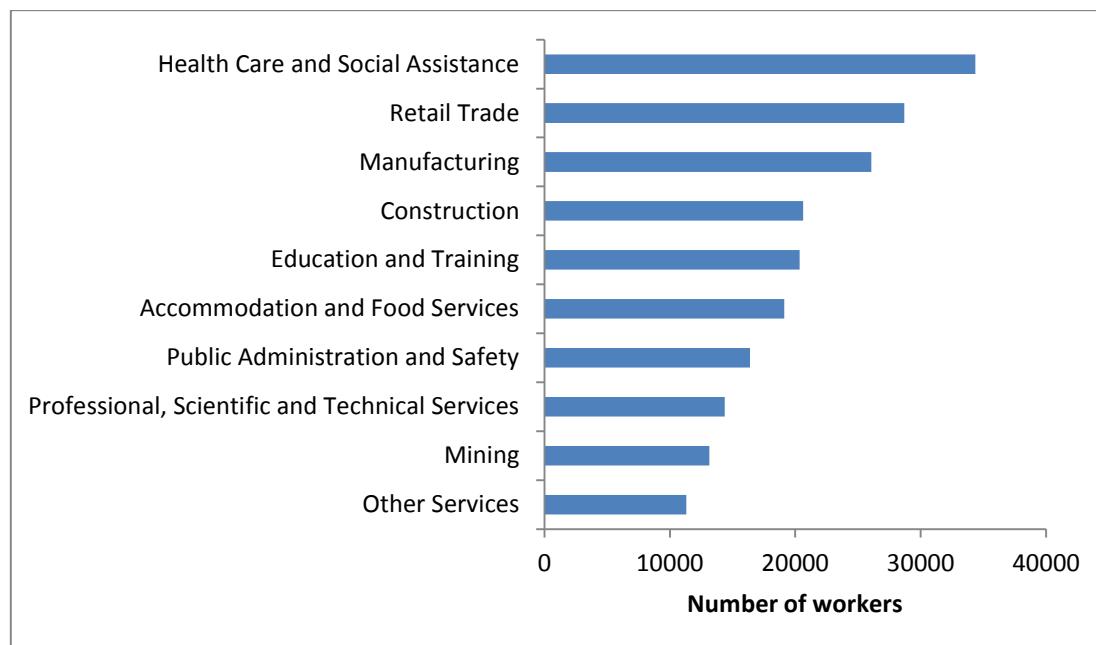
NSW international exports are valued at around \$65 billion per year. The Hunter's exports of coal account for 17 per cent of NSW total exports.<sup>22</sup>

The money from coal sales goes to paying employees, other input spending, company profits and government revenue. It is important to note that the mining industry is also a recipient of government subsidies and tax breaks. At a federal level, this assistance has been estimated at \$4.5 billion dollars per year,<sup>23</sup> while the NSW state government provided support of at least \$872 million 2008-09 and 2013-14.<sup>24</sup>

## Employment

Modern coal mining is capital intensive, relying on machinery rather than labour. As shown in Figure 2 below, only five per cent of the Hunter workforce is in mining – 13,140 people out of a total workforce of more than 260,000 people. According to ABS industry classifications, mining is the ninth largest employing industry, well behind industries like health care, retail, manufacturing, construction and education:

**Figure 2: Hunter Valley (inc Newcastle) employment by industry**



Source: ABS 2011 census.

In other words, 95 per cent of the Hunter workforce does not work in the mining industry.

<sup>21</sup> Deloitte Access Economics (2013)

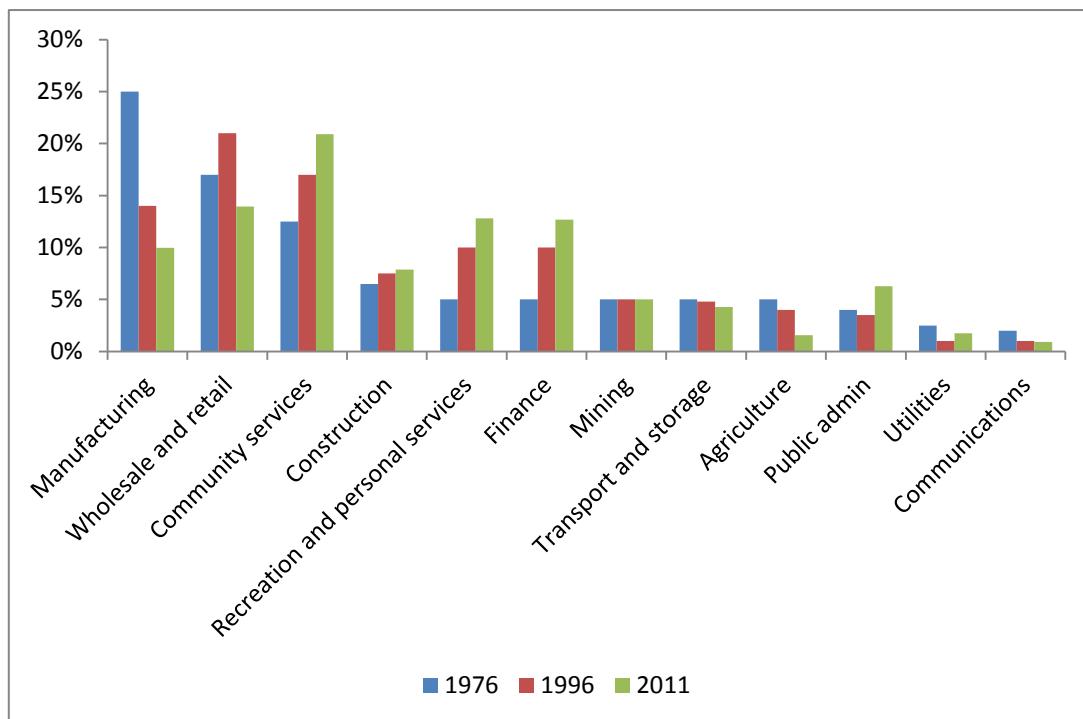
<sup>22</sup> ABS (2013a) This is based on 2010-11 export figures as these are the latest coal export values supplied in NSW Trade & Investment (2013), see page 247, table 35.

<sup>23</sup> Grudnoff (2013) *Pouring more fuel on the fire: the nature and extent of federal government subsidies to the mining industry*

<sup>24</sup> Peel, Campbell and Denniss (2014) *Mining the age of entitlement: State government assistance to the mineral and fossil fuel sector*

The Hunter Valley Research Foundation (HVRF), a Newcastle-based economic research organisation, explored the diversification of the Hunter economy from the 1950s to the present. They found that employment in primary industries, such as agriculture and mining, peaked in 1952.<sup>25</sup> Since then the Hunter economy has seen the rise of secondary industries such as manufacturing, which in turn have given way to the tertiary sector – mainly services – as the most important industries. This development is shown in Figure 3 below, which shows changes in share of employment by industry for the years 1976, 1996 and 2011.

**Figure 3: Change in employment share by industry 1976, 1996 and 2011**



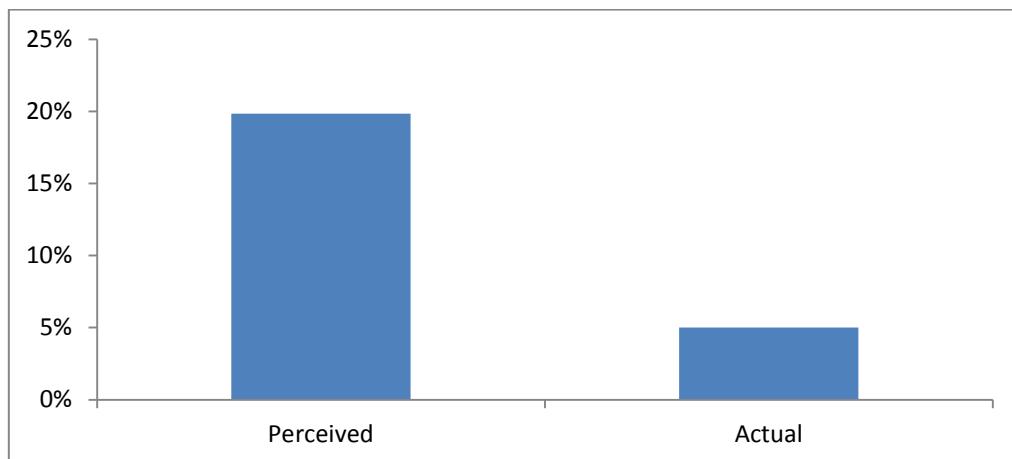
Sources: HVRF 2011, page 8, figure 4, and ABS 2011 census. Note that, due to changing ABS categories, some industry classifications have had to be merged by HVRF and for this report. The categories in 1976 and 1996 in Figure 3 above are the same as those in HVRF 2011. In the 2011 figures, ‘Community services’ is a combination of the ABS classifications ‘Health Care and Social Assistance’ and ‘Education and Training’. ‘Recreation and personal services’ is a combination of ‘Arts and Recreation Services’, ‘Accommodation and food services’ and ‘Other services’. ‘Finance’ is a combination of ‘Professional, Scientific and Technical Services’, ‘Administrative and Support Services’, ‘Finance and Insurance Services’ and ‘Rental, Hiring and Real Estate Services’. Other categories have been maintained.

We see that manufacturing employment share has declined from 25 per cent to 10 per cent, while services such as community services (including health care and education), recreation and personal services (including accommodation, hospitality, arts and recreation) and finance (including professional services, administrative support, real estate and insurance) have shown strong growth. Mining has remained steady at five per cent despite, or perhaps because of, the long commodities boom.

Despite being a relatively minor employer, public perception is that mining employment is much more significant. In our survey we asked respondents to estimate what proportion of the Hunter workforce worked directly in mining. Poll respondents had the perception that mining employment was nearly four times greater than reported in the census, with an average response of 19.8 per cent, as shown in Figure 4 below:

<sup>25</sup> HVRF (2011), p5

**Figure 4: Percentage of Hunter Valley workforce in coal mining average poll response and actual employment**

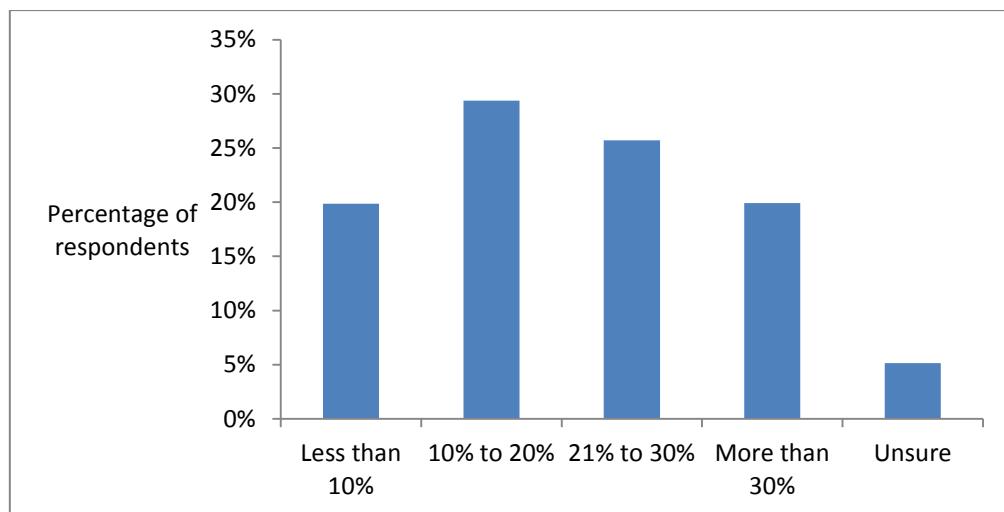


Sources: Survey of 1,001 Hunter residents, ABS census 2011.

This public perception, that mining is a far larger employer than it really is, compounds the industry's political power and the weight of its lobbying agenda.

The most popular response from Hunter residents was that mining employed 10 to 20 per cent of the Hunter labour force (29 per cent of respondents), while more than half of respondents estimated that the mining industry employed over 20 per cent of workers. Only 20 per cent of those surveyed answered correctly, that mining employs less than 10 per cent of workers in the Hunter, as shown in Figure 5 below:

**Figure 5: Approximately what percentage of workers in the Hunter Valley and Newcastle do you think work in the coal mining industry?**



Source: Survey of 1,001 Hunter residents.

While mining is an important employer in certain local government areas, overall, and in larger population centres, its share is under five per cent. Only in the most intensive areas of the valley, Muswellbrook and Singleton, do employment levels reach the perceived level overall.

Given the modest numbers of people employed in the Hunter's mining industry, industry supporters prefer to emphasise 'indirect' or 'downstream' jobs. These are jobs in other industries that the mining industry claims to have 'created' through its interaction with the wider economy. For example, the NSW Minerals Council claims that mining in the Hunter directly employs 12,653 people – broadly in line with ABS census estimates – but also creates 59,084 'indirect' jobs.<sup>26</sup>

Estimates from industry bodies such as this overlook an important fact – all industries contribute to the creation of indirect jobs. When nurses and teachers spend their wages, when hospitals and schools buy supplies and construct new facilities, they are all affecting other industries and could claim to be creating indirect jobs. As all jobs help to create other jobs, if we counted up the indirect jobs that all industries create, we would come up with a number of jobs several times larger than the Australian workforce.

The type of economic modelling used to come up with these indirect jobs in this manner has been described as "biased"<sup>27</sup>, "deficient"<sup>28</sup> and regularly "abused"<sup>29</sup>. It is mainly used by industries and projects seeking public assistance and approval. Industries that do employ lots of people, like health care and education, generally do not need to estimate their indirect jobs to demonstrate their importance. Only relatively small employers like mining employ economists to make these estimates.

## Other spending

Related to claims about indirect jobs are claims about the downstream businesses supported. The NSW Minerals Council estimates that the Hunter Valley mining industry patronises 4,871 businesses.<sup>30</sup> Putting this in context, there are over 43,000 businesses in the Hunter Valley and Newcastle region. The Hunter Valley coal industry therefore patronises around 11 per cent of local businesses.<sup>31</sup> Alternatively, 89 per cent of Hunter Valley businesses are not directly patronised by the coal industry.

## Government revenues

Mineral royalties make up around two per cent of government revenues – \$1.5 billion in 2011-12 and \$1.3 billion in 2012-13.<sup>32</sup> Far greater contributions come from state taxation and the Commonwealth. Mineral royalties are less significant than gambling and betting taxes and contribute slightly more than traffic fines and licence fees, as shown in Figure 6 below:

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<sup>26</sup> Lawrence Consulting (2013) *NSW Mining Industry Economic Impact Assessment 2012/13*

<sup>27</sup> ABS (2011b) *Australian National Accounts: Input-Output Tables - Electronic Publication, Final release 2006-07 tables*

<sup>28</sup> Preston (2013) *Judgement on Bulga Milbrodale Progress Association Inc v Minister for Planning and Infrastructure and Warkworth Mining Limited*

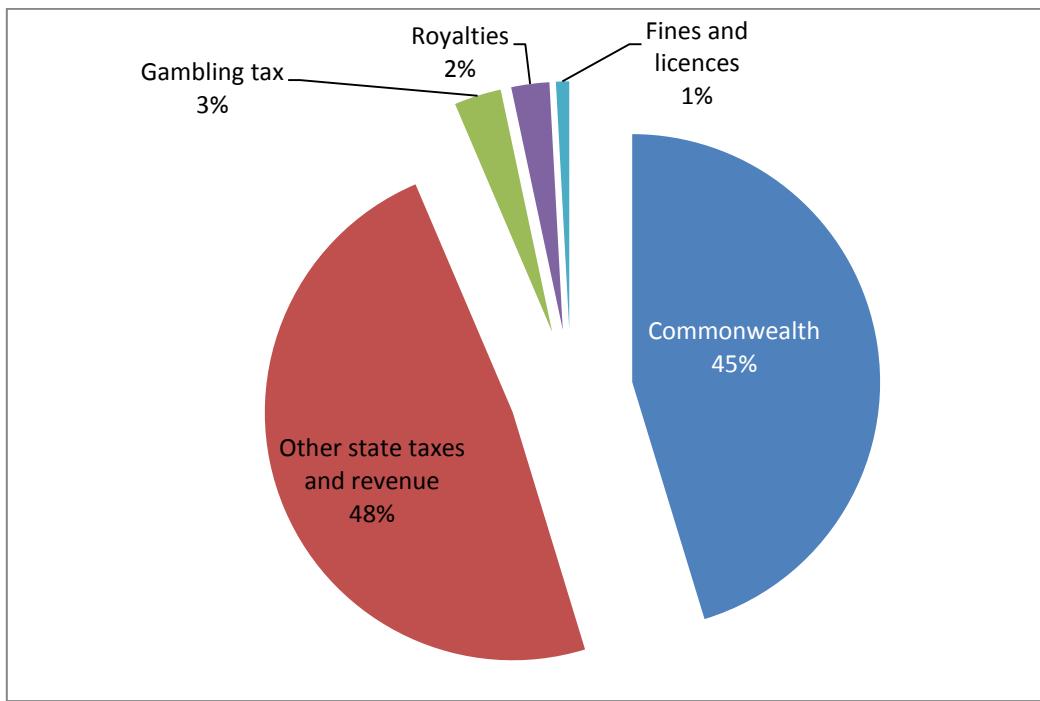
<sup>29</sup> Denniss (2012) *The use and abuse of economic modelling in Australia: Users' guide to tricks of the trade*; Gretton (2013) *On input-output tables: uses and abuses*; Layman (2002) *The Use and Abuse of Input-Output Multipliers*

<sup>30</sup> Lawrence Consulting (2013)

<sup>31</sup> ABS (2010a, 2010b, 2013c) *Regional Profiles*; Wilkinson (2011)

<sup>32</sup> NSW Government (2013d) *NSW Budget Statement*

**Figure 6: NSW government revenue by source**



Source: NSW Budget papers 2013-14 Chapter 6.

Mining companies also contribute to federal government revenues through company tax. Relative to other industries, however, they are lightly taxed, paying an effective tax rate of 13.9 per cent of gross operating surplus.<sup>33</sup>

Despite these modest contributions, the mining industry likes to emphasise the money it pays to state governments as royalties – that is, the money it pays to the government to buy the coal that belongs to the people of NSW. The NSW Minerals Council website claims:

*NSW mining is an important part of the NSW economy, but did you know that our miners also help our nurses, teachers and police do their jobs too. That's because mining royalties provided to the State Government – around \$1.5 billion in 2011-12 – all help provide essential services as well as the important transport infrastructure that helps us get around the state.*

As discussed above, mineral royalties are a relatively modest part of NSW government budgets, accounting for around two per cent of state government revenue.<sup>34</sup> Putting this in the context of expenditure on health and education, the NSW government has budgeted over \$27 billion for running the state's schools, hospitals and police in 2013-14.<sup>35</sup> If we were relying on coal royalties to fund these services alone, they would run only from January 1 to January 19 – less than three weeks. The other 49 weeks of the year are funded by other sources, to say nothing of expenditure on other areas such as roads, courts and so on.

Survey results show that the public perception of the contribution of coal royalties to state finances is far greater than the reality – almost ten times their actual proportion. As shown in

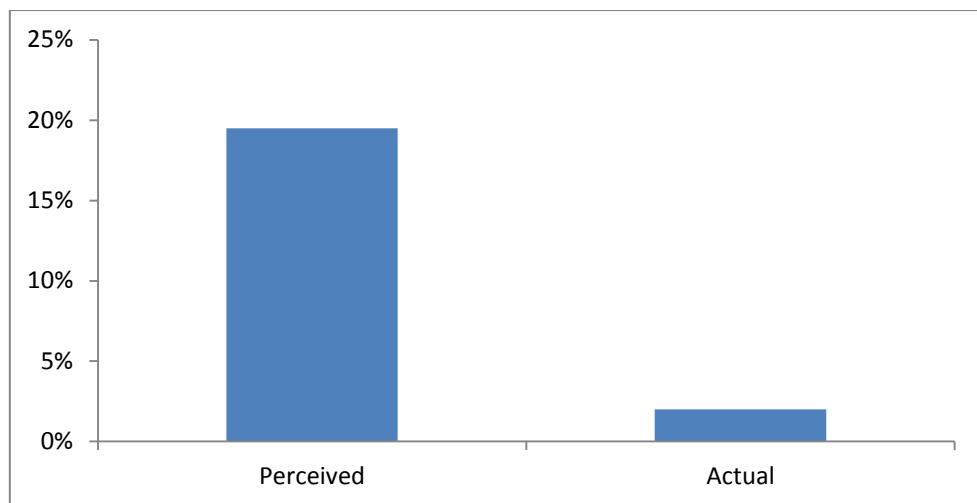
<sup>33</sup> Richardson and Denniss (2011) *Mining the truth: the rhetoric and reality of the mining boom*

<sup>34</sup> Coal royalties make up around 95 per cent of mineral royalties in NSW (NSW Government, 2013d). Contributions from other minerals have not been separated out in this analysis.

<sup>35</sup> NSW Government (2013a, 2013b, 2013c) *NSW Budget Paper number 3*

Figure 7 below, our survey returned an average expected value of 19.5 per cent of state revenues coming from coal royalties:

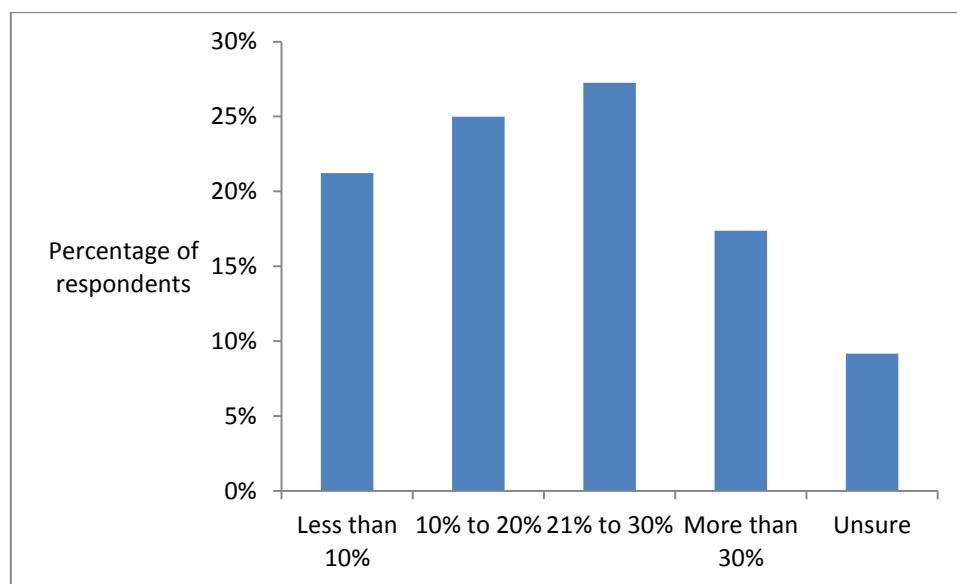
**Figure 7: Perceived and actual contribution of coal royalties to NSW government revenue**



Source: Survey of 1,001 Hunter residents.

With public perception of the importance of coal royalties so much greater than the reality, it is easy for the mining industry to make claims on its websites and in the media about the importance of the industry for funding services such as hospitals and schools. Only 21 per cent of people responded that royalty revenue makes up less than 10 per cent of NSW government revenue, while 70 per cent believed that royalties were over 10 per cent, as shown in Figure 9 below:

**Figure 8: Perceptions of the importance of coal royalties to NSW government revenue**



Source: Survey of 1,001 Hunter residents.

Overall, we see that there is a very strong perception that coal royalties account for a large portion of the state's revenue. This is likely reinforced by industry claims such as that quoted

above. Such claims tend to include royalty revenue figures in absolute terms – around \$1.5 billion – rather than as a portion of the state's \$59 billion annual revenue. While \$1.5 billion appears a lot of money, in the context of running the largest state budget in Australia, it is a relatively modest amount.

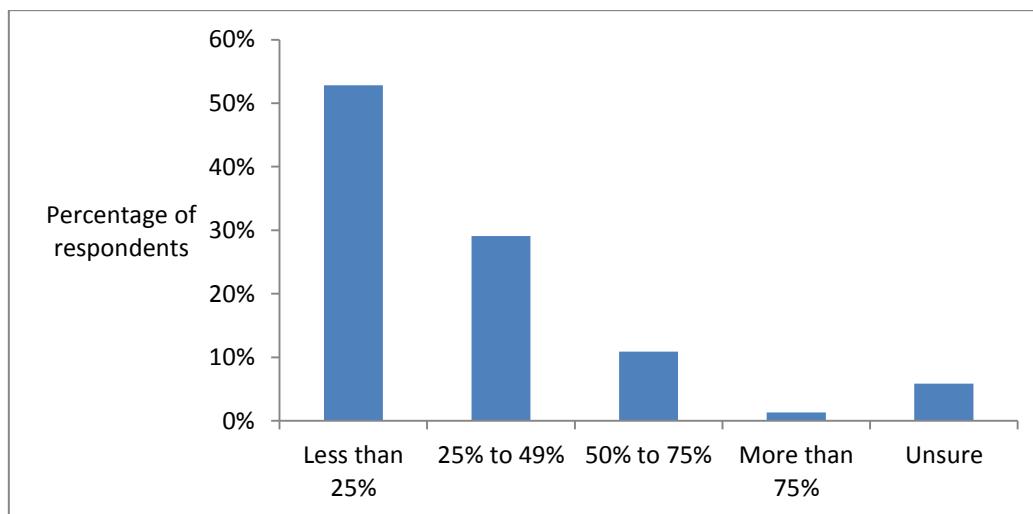
## Profits and foreign ownership

The ABS recently estimated that the coal industry operates at a profit margin of 24.3 per cent.<sup>36</sup> While smaller and more speculative projects have been experiencing difficulty in recent times, the major operations are strongly profitable on their existing assets.

Most of these profits do not remain in the Hunter Valley, but go overseas – the Hunter Valley coal industry is predominantly foreign owned. Of the 29 coal mines producing in the Hunter and Newcastle coalfields in 2010-11,<sup>37</sup> only two were majority-Australian owned. Only six had any substantial Australian ownership, while twenty-one were entirely foreign owned, 79 per cent of all Hunter and Newcastle mines. Furthermore, the two majority Australian-owned mines are small producers, accounting for just two per cent of the region's saleable production. Taking volume into account, all Australian ownership of Hunter Valley coal sales represents just 10 per cent of saleable production.

More than half of respondents answered that the Hunter coal industry is less than 25 per cent Australian owned, as shown in Figure 15 below:

**Figure 9: Approximately what percentage of Hunter Valley coal mining do you think is Australian owned?**



Source: Survey of 1,001 Hunter residents.

These results suggest Hunter Valley residents are better informed than the respondents to a 2011 Australia Institute poll of Australians nationwide. That poll found that respondents thought the mining industry was around 50 per cent Australian owned.<sup>38</sup> In the current survey a significant minority, however – 41 per cent – felt that there were substantial levels of

<sup>36</sup> ABS (2013b) *Mining Operations, Australia, 2011-12*

<sup>37</sup> Latest year provided in NSW Trade and Investment (2013). Other sources for these calculations include company websites and annual reports and Edwards (2011). Note that this analysis includes all of the Newcastle coalfield mines, even though some fall outside LGA boundaries used elsewhere in this report. We do not include the two operating mines in the Gloucester Coalfield.

<sup>38</sup> Richardson and Denniss (2011)

Australian ownership. Workers in the Hunter mining industry were well informed, with 68 per cent answering ‘less than 25 per cent Australian ownership’, 26 per cent ‘less than half’ and with almost no responses in the upper ranges.

## Air quality and health

The Hunter faces many air quality challenges. There is a large urban area in the Lower Hunter, with rural areas further inland. Sources of air pollution include vehicles, industrial operations, bushfires and wood smoke. Coal mines and coal transport are also major contributors of particulate pollution. Particulate pollution is often categorised as PM10 and PM2.5 (indicating the measurement on particulate matter of a diameter of 10 or 2.5 micrometers or less). A Senate inquiry into impacts on health of air quality in Australia found last year:<sup>39</sup>

*Coal is a potential source of dust and particulates throughout its lifecycle as a fuel. Coal is likely to be a source of significant air pollution if not properly managed during extraction, storage, and transport. It is also a source of significant CO<sub>2</sub> emissions during burning. Evidence provided from the NSW EPA indicated the contribution of coal mining to emission levels in that state broadly, with mining for coal accounting to 27.6 per cent of PM2.5 in the greater metropolitan region of Wollongong, Sydney and Newcastle (GMR), 58.4 per cent of PM10 in the GMR. In the Upper Hunter region (UHR), those levels are higher, at 66 per cent of PM2.5 and 87.6 per cent of PM10 emissions.*

These high levels of particulate pollution are of concern primarily due to their impact on human health. Particulate pollution is linked to cardiovascular and respiratory diseases, types of cancer and premature death. For some particles there is no safe level of exposure – even low levels of exposure can lead to health problems.<sup>40</sup>

NSW EPA data shows that in 2013 air quality monitors recorded 171 breaches of the national guidelines for PM10 in the Hunter Valley.<sup>41</sup> While bushfires account for many of these, coal mining also plays a significant part. This seems to be recognised by survey respondents, with a strong majority of Hunter residents answering that coal mining has a negative effect on air quality in the Hunter region, as shown in Figure 10.

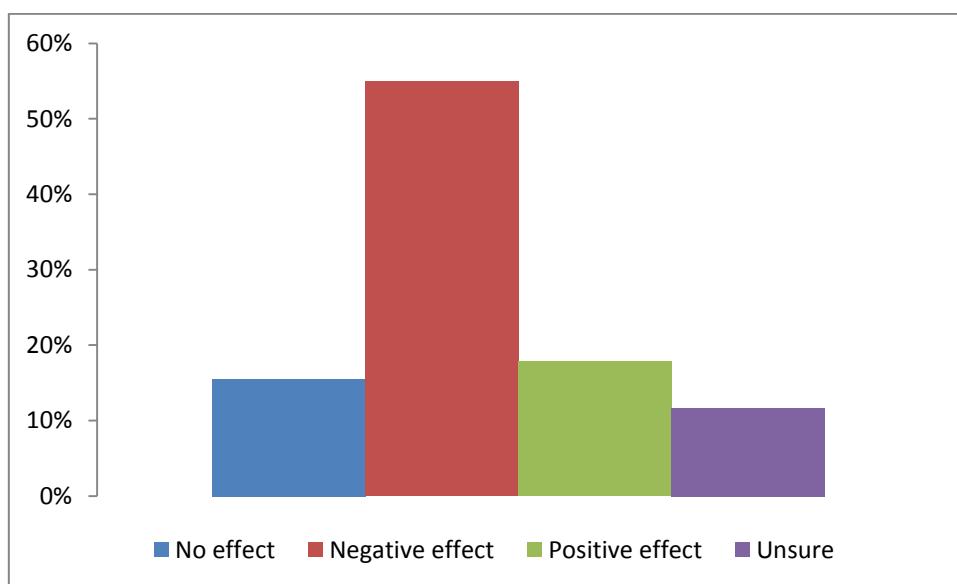
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<sup>39</sup> Senate Standing Committee on Community Affairs (2013) *The impacts on health of air quality in Australia*

<sup>40</sup> Pui, Chen and Zuo (2013) *PM2.5 in China: Measurements, sources, visibility and health effects, and mitigation*; Raaschou-nielsen et al. (2013) *Air pollution and lung cancer incidence in 17 European cohorts*; USA Environmental Protection Agency (2009) *Integrated Science Assessment for Particulate Matter*

<sup>41</sup> NSW Department of Environment and Heritage (2014) *Air quality data*. See also Milman (2014) *Coal crackdown urged as air pollution breaches rise by 50% in Hunter Valley*

**Figure 10: Do you think coal mining has an effect on air quality in the Hunter Valley?**



Source: Survey of 1,001 Hunter residents.

Responses were broadly similar across the sample of respondents, regardless of gender, place of residence (rural versus urban), age or industry of employment. Even among workers in the mining industry, 43 per cent felt the industry was having a negative effect on air quality and health.

### *Case study: Terminal 4 proposal and the economics of air pollution*

In 2012 a proposal was launched to expand Newcastle's coal-loading facilities with a fourth coal terminal, better known as T4. The proposal was to expand export capacity from the currently approved 211 Mtpa by 120 Mtpa to 231 Mtpa. The initial economic assessment for the project estimated it could be worth a staggering \$60 billion for the NSW community. This estimate proved to be flawed when, only months later, the proponents, Port Waratah Coal Services, delayed and downsized the project.

Economic costs of air pollution due to human health impacts were not included in the economic assessments of the original proposal, nor the downsized project. This despite the environmental impact statement for the project stating that maximum 24-hour average concentrations of PM10 particles already exceed guidelines in all assessment locations and that the T4 project would further contribute to these high levels.

The economic costs of air pollution have been assessed in NSW. In 2005 the then NSW Department of Environment and Conservation prepared a major study on the economic costs of air pollution in the Greater Sydney Metropolitan Region, which includes the lower Hunter. The study's middle estimate of the annual health costs for average pollution levels was \$4.7 billion across the greater metropolitan region and \$1 billion just in the lower Hunter.

Based on this study, a researcher from University of Newcastle estimated that the original proposal to expand the terminal by 120 Mtpa would increase health costs by \$29 million per year. Consideration of this value should be included in economic assessment of the project under NSW government guidelines.

References: (DEC NSW, 2005; EMGA Mitchell McLennan, 2012; Gillespie Economics, 2012b, 2013; HCEC, 2013; NSW Treasury, 2007)

## Environmental impacts

### Water and bushland

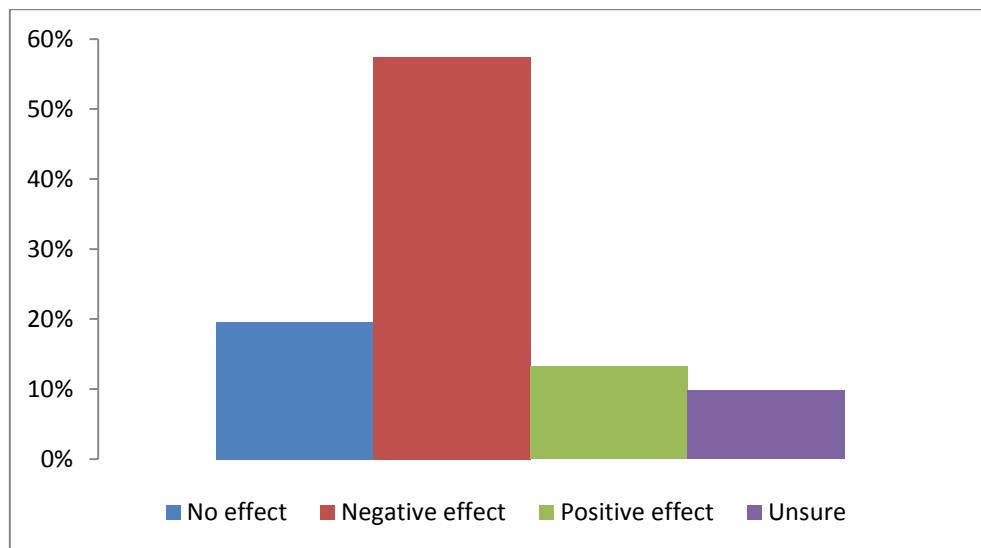
The coal industry is a major user of water in the Hunter and has an influence on water quality. Hunter coal mines use water mainly for controlling dust by spraying water on piles of coal and excess dirt and also for processing coal.<sup>42</sup>

The Hunter River has naturally high levels of salinity due to the marine origin of rocks and sediments beneath the surface. Mines often need to discharge saline water that collects in pits and shafts or results from operational use. This water can be highly saline and has the potential to significantly increase salt levels in the already saline river. Mine waste water can also contain a range of other pollutants.<sup>43</sup>

In addition to impacts on water, the expansion of open-cut coal mines over the last decade has had considerable impact on areas of natural vegetation. Some mines have expanded into areas of environmental significance and endangered ecological communities. For example, the Warkworth extension project proposed to expand through the only known area of Warkworth Sands woodland in the world – forest that grew on the top of ancient sand dunes (see page 19).

Areas of native vegetation destroyed by mines must be ‘offset’ by creating or preserving other areas of the same vegetation – but this is not always possible where ecological communities are reliant on underlying geological conditions. Ecologists are sceptical that offsets are capable of preserving ecological values.<sup>44</sup> These sentiments seem to be shared by survey respondents, 57 per cent of whom felt coal mining was having a negative impact, as shown in Figure 11 below:

**Figure 11: Do you think coal mining has an effect on water and bushland in the Hunter Valley?**



Source: Survey of 1,001 Hunter residents.

<sup>42</sup> NSW Minerals Council (2011) *Water use in the NSW minerals industry*

<sup>43</sup> NSW EPA (2013) *Review of the Protection of the Environment Operations (Hunter River Salinity Trading Scheme) Regulation 2002*

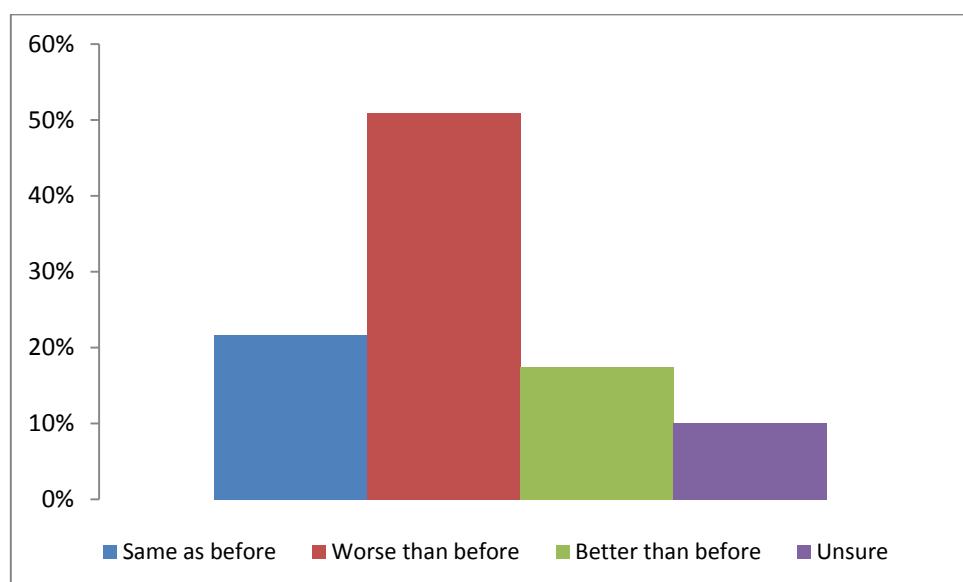
<sup>44</sup> (Bekessy et al., 2010; Gibbons & Lindenmayer, 2007; Walker, Brower, Stephens, & Lee, 2009) *Why bartering biodiversity fails*

Even within the mining industry, 44 per cent of respondents felt there was a negative impact on these areas, while negative impressions were at nearly 70 per cent within the health, education and public service professions.

### *Mitigation measures*

Respondents were also reminded that various mitigation strategies are implemented to reduce and offset the impacts of coal mining on the community and environment. Industry advocates often emphasise mitigation and rehabilitation of mine sites – however, attitudes towards mitigation strategies were strongly negative, with 51 per cent of respondents believing they do not effectively offset the impacts of mining, as shown in Figure 12 below:

**Figure 12: Perceptions of coal mining mitigation effectiveness: Mitigation strategies leave areas ...**



Source: Survey of 1,001 Hunter residents.

### *Other industries*

Environmental impacts such as those on air, water and land discussed above can also have an economic effect on other industries in the Hunter. Such impacts are rarely incorporated into the economic models that assess the impact of the coal industry. These models assume that there is an infinite amount of water, that no pollution is caused, and that ecologically sensitive areas can be perfectly offset.

In reality the environmental impacts of the Hunter mining industry have a strong influence on other industries. Its water use and air pollution and expansion into farm land has a particularly strong impact on agriculture. As one observer put it:

*The rapid expansion of coal production and the impending development of CSG have intensified concerns over conflicts between the mining industry and other land use industries, particularly agriculture and viticulture.<sup>45</sup>*

The most heavily affected industries are perhaps the Hunter's agricultural industries, including horse studs and vineyards. A study commissioned by the horse industry found that

<sup>45</sup> Deloitte Access Economics (2013) p36

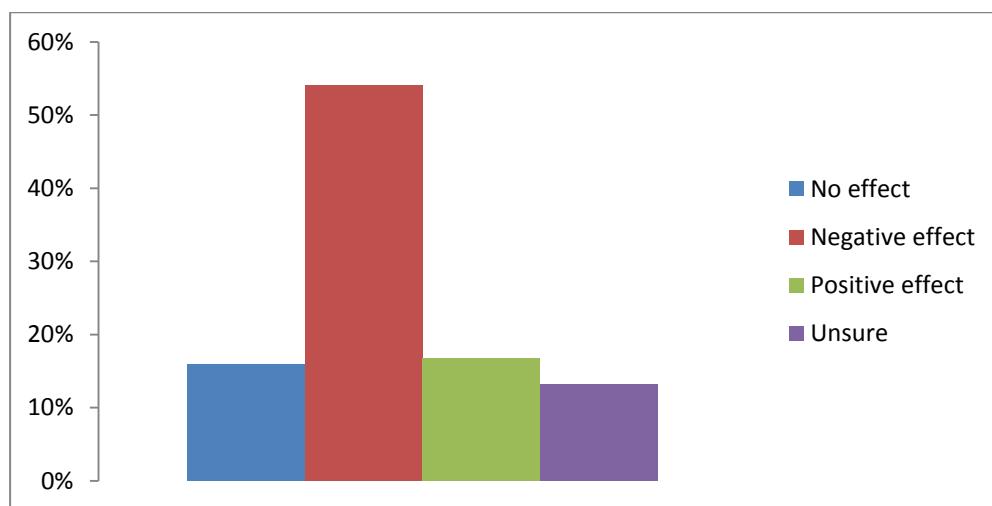
a nearby the mine threatened the viability of the wider horse breeding industry in the Hunter, and estimated that 640 jobs were at risk.<sup>46</sup>

The Hunter's wine and wine-related tourism industry is also affected by the expansion of coal mining. In addition to competition for water and land resources, actual and perceived impacts on the amenity of the area take a toll on these industries.

Other industries are affected by the macroeconomic effects of rapid mining expansion – competition for skilled labour places pressure on manufacturing and agriculture, while the effects of a high exchange rate weigh down the wider tourism industry and education.

Perhaps in response to the concerns of other industries, the NSW Minerals Council recently produced a series of publications and videos to present its view that other industries can easily coexist with large-scale mining.<sup>47</sup> While these publications may have had some impact, 55 per cent of survey respondents felt that coal mining has a negative effect on other industries, as shown in Figure 12 below.

**Figure 13: What effect does coal mining have on other industries such as agriculture, vineyards, horse studs and tourism in the Hunter Valley?**



Source: Survey of 1001 Hunter residents.

<sup>46</sup> Marsden Jacobs Associates (2013) *Economic impact of the proposed Drayton South Open-cut Coal Mine development on the Hunter Valley Thoroughbred Industry*, see also box text

<sup>47</sup> See for example (NSW Minerals Council, 2013a, 2013b, 2013d)

## *Case study: Warkworth mine extension appeal in the Land and Environment Court*

In 2012 a Hunter Valley community group, the Bulga Milbrodale Progress Association, challenged the approval of Rio Tinto's Warkworth coal mine extension in the NSW Land and Environment Court. Part of the case related to the project's impact on four different endangered ecological communities, which are home to a range of endangered animals, birds and plants.

In particular, the Warkworth Sands Woodland is a unique type of ecological community that forms only on ancient windblown sand deposits. It is home to the threatened squirrel glider and three species of threatened birds – the speckled warbler, the brown treecreeper and the grey-crowned babbler. Warkworth Sands Woodland has always been restricted by its unique geological base, but has been further reduced since European settlement by coal and sand mining, mining infrastructure, agricultural clearing and weed invasion. Only around 460 ha, or 13 per cent of its original extent, remains today.

The Warkworth mine extension proposed to clear another 107 ha of the woodland, with this clearing to occur in the largest and most intact area. Another 650 ha of different endangered ecological communities were also proposed to be cleared. A witness for the community group said to the court:

*Any development that proposes to remove around 25 per cent of the total known distribution of Warkworth Sands Woodland, which is found only in the vicinity of Warkworth in the Hunter Valley of NSW, including most of the high quality examples of it, contradicts the ideals of threatened species legislation.*

The judge agreed, finding that given the magnitude of these impacts, it was not possible to manage them with mitigation and offset measures. The court found that the mine extension should not proceed – based on impacts on biodiversity as well as noise and dust and social and economic factors.

Rio Tinto and the NSW government appealed the Land and Environment Court's decision in the Supreme Court of NSW. Their appeals were dismissed, with costs, in April 2014. Rio Tinto is planning to resubmit a similar application under new legislation passed in the wake of the Land and Environment Court judgement.

References: (Preston, 2013) quote from p.42, Supreme Court of NSW (2014)

## *Case study: Drayton South Project impact on thoroughbred horse breeding*

The Drayton South Coal Project near Muswellbrook is proposing to build an open-cut coal mine within one kilometre of the two largest thoroughbred horse studs in the Australia. Coolmore and Darley studs are central to the Hunter region's horse industry and part of the official Equine Critical Industry Cluster (CIC). They produced 2,249 live foals in 2011, 34 per cent of NSW breeding, with servicing fees of nearly \$100 million representing over half of the NSW total and 40 per cent of Australia's total.

The economic assessment of the project for the proponent, Anglo American Coal, claimed that:

*[The] minor increase in dust levels should not result in any additional health or production problems for the horses on these studs. It was also not expected that noise levels predicted to be generated by the Project will have any impact on the equine population on surrounding horse studs. The ground vibration and overpressure from blasting arising from the Project is expected to be intermittent and minimal across the Coolmore and Darley properties and is very unlikely to have any adverse effects on equine health. (p14)*

Submissions from the horse studs disagreed, describing this assessment as "fundamentally deficient and misleading". (pESi) While disputing that noise and dust impacts would be minor, they also claimed that the perception of their businesses would change with a major coal mine so close, forcing them to suffer losses not included in the proponent's economic assessment:

*Darley Australia and Coolmore Australia believe they will be critically impacted by the development of the proposed Drayton South coal mine. The structure and nature of the thoroughbred industry means that it is linked to high net worth clients who are highly mobile in their market choices, so reputation is fundamental to success.*

*Consequently, Darley Australia and Coolmore Australia have advised that if the coal mine were developed they would probably be forced to move their stud operations, either interstate or overseas. They would not move their stud operations to somewhere else in the Hunter Valley or NSW, because of the risk of future mine development in NSW undermining their investment certainty and decisions. (p16)*

The NSW Planning and Assessment Commission (PAC) commissioned its own report to assess these competing claims, which concluded:

*The Project, in its current form, is incompatible with the Upper Hunter Equine CIC. If approved it will likely trigger the exit of Coolmore and Woodlands horse studs from the cluster. If these studs leave the cluster, this will cause the immediate decline and possible demise of the CIC. (Appendix 4 p37)*

The PAC has recommended against the approval of the Drayton South project, due to its impact on the horse industry. The Department of Planning was assessing this recommendation at time of writing.

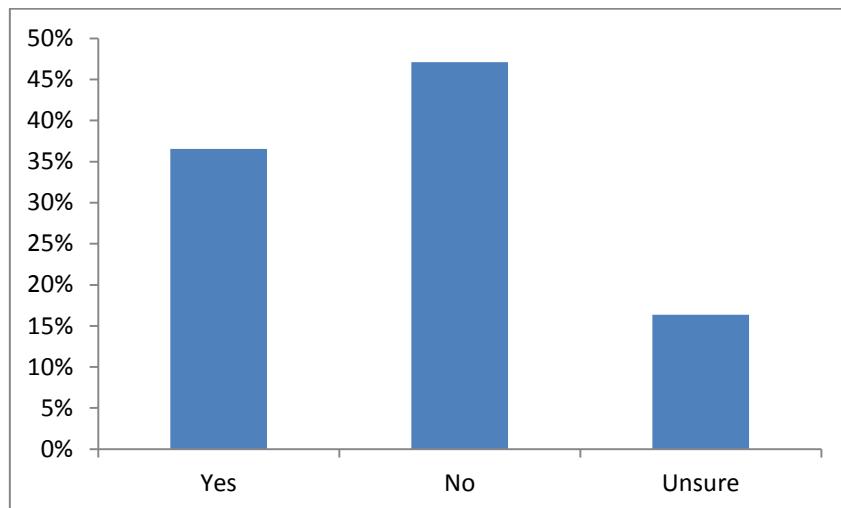
References: (Gillespie Economics, 2012a; Marsden Jacobs Associates, 2013; PAC, 2013)

## Costs and benefits of coal mining

Even the coal industry's staunchest advocates usually concede that mining has some impact on the Hunter's environment and communities. Differences of opinion usually arise over whether these impacts are well managed and whether they are outweighed by the economic benefits that the industry brings, such as jobs and royalties. Our survey asked respondents about these issues.

After giving their impressions of the economic benefits of coal mining – employment and royalty revenues – and of the costs to health, the environment and other industries, respondents were asked "Do you think the economic benefits of coal mining in the Hunter Valley outweigh any potential effects on health, the environment and other industries?". Overall, nearly half (47 per cent) felt that the benefits did not outweigh the costs, as shown in Figure 14 below:

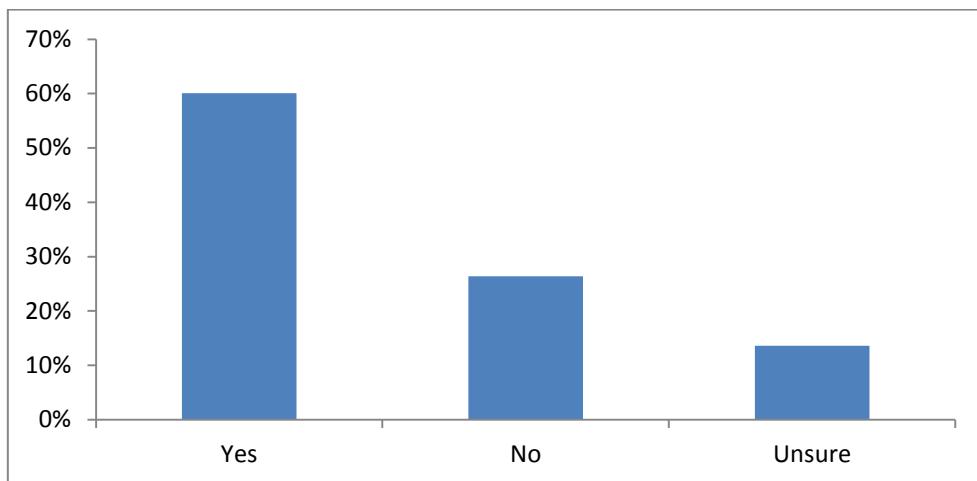
**Figure 14: Do the economic benefits of coal mining outweigh effects on health, the environment and other industries?**



Source: Survey of 1,001 Hunter residents.

Responses to this question varied strongly by the industry of employment of the respondents. Unsurprisingly, among workers in mining there were high levels of support for the industry, with 60 per cent feeling the benefits outweighed the costs. While this shows stronger support than from respondents in other industries, an alternative view is that more than one in four mining workers feels their industry does not make a net contribution to society. Forty per cent are not convinced that coal mining's benefits outweigh its costs, as shown in figure 15 below:

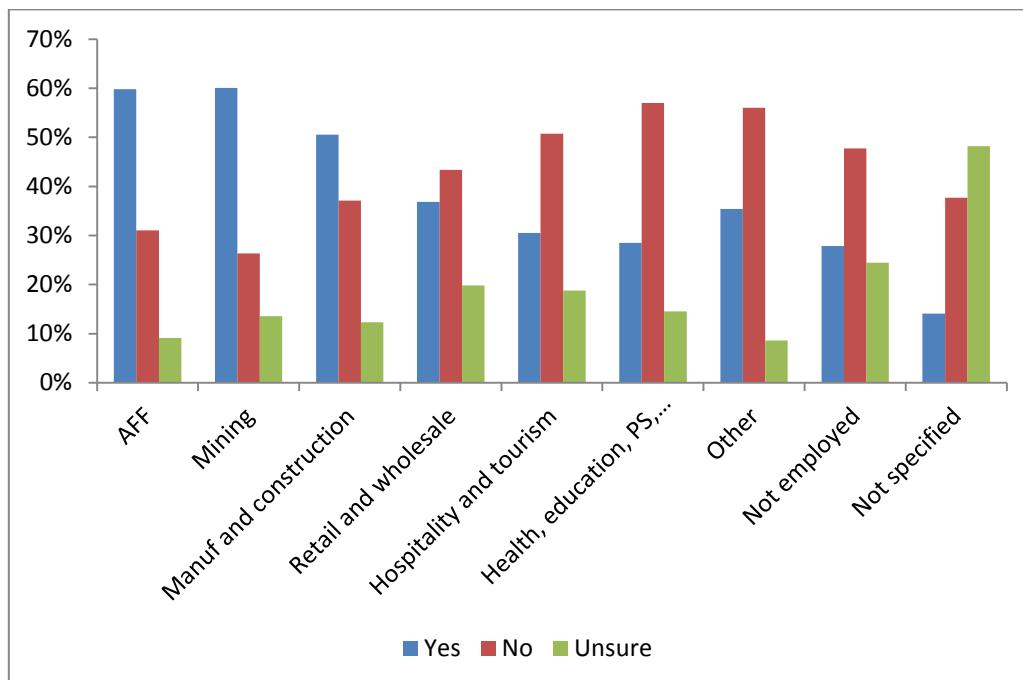
**Figure 15: Do the benefits of coal mining outweigh the costs - mining industry respondents**



Source: Survey of 1001 Hunter residents.

A majority of workers in the agriculture, forestry and fishing category and manufacturing and construction category also felt the benefits of coal mining outweighed the costs. All other industries felt the coal industry delivered a net cost, as shown in Figure 16 below:

**Figure 16: Do the benefits of coal mining outweigh the costs – all industries**



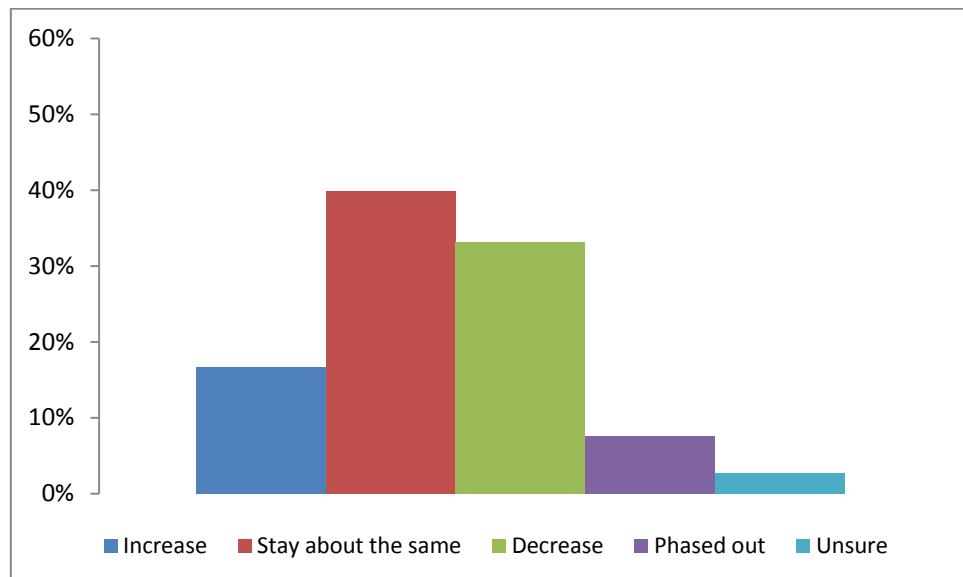
Source: Survey of 1,001 Hunter residents. Note that due survey limitations some ABS industry categories were amalgamated. See appendix question Z2 for industry classifications available to respondents.

## The future of coal in the Hunter Valley

While the NSW government and coal industry are planning to expand coal production and exports, a range of community and environment groups advocate a reduction or complete phase-out of the industry. With diverging opinions on whether today's coal industry provides a net benefit to the Hunter, we asked respondents about what they would like a future Hunter coal industry to look like.

In the last question of the survey, following consideration of the economic benefits and wider costs of coal mining, respondents were asked about what levels of coal mining they would like to see in the Hunter Valley over the long term. Forty-one per cent of respondents would like to see the industry decrease in size or be phased out entirely. Forty per cent would like to see it remain the same, while only 17 per cent of respondents would like to see levels of coal mining increase, as shown in Figure 17 below:

**Figure 17: Over the long term, would you like to see levels of coal mining in the Hunter Valley ...?**

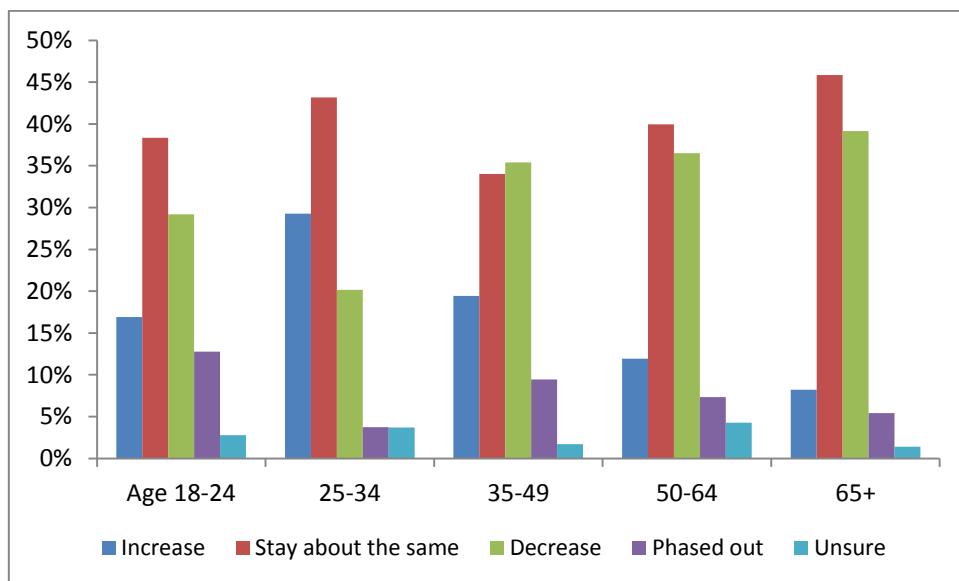


Source: Survey of 1,001 Hunter residents.

Residents of urban Newcastle or Lake Macquarie were more likely to favour a decrease or phase out of the coal industry than those in rural areas – 47 per cent compared to 37 per cent. While 42 per cent of mining workers are supportive of an increase in their industry, it is notable that 13 per cent prefer a reduction or a phase out. This reflects the finding above that 26 per cent of the mining industry did not think its costs were outweighed by its benefits. More than half of health, education and public service workers would like to see the industry decrease or be phased out.

Older respondents were less supportive of the coal industry than average, with around 44 per cent supporting reduction or a phase out, as shown in Figure 18 below.

**Figure 18: Preferred future levels of coal mining by age group**



Source: Survey of 1,001 Hunter residents.

Younger age groups showed considerable variation. As shown in Figure 18, 25- to 34-year-olds are considerably more supportive of an increase in coal mining, while the 18 to 24 age group contained the largest portion favouring a phase out of the industry.

## Hunter coal in context

This paper finds that the Hunter's coal industry is a large producer and exporter; a modest contributor to employment, Hunter businesses and the NSW state government; and an industry with considerable impacts on the environment, communities and other industries. The industry's political power, however, stems from the perception that it is 'vital' to NSW and the Hunter, rather than being a small part of their diverse economies.

Reassessing some of the industry's claims in the context of the wider economy, we see that this image is presented for public perception, but is not entirely reflective of economic reality. In Table 1 below, we return to some of the NSW Minerals Council claims mentioned in the introduction to this report and place them in the context of the wider economy:<sup>48</sup>

<sup>48</sup> NSW Minerals Council (2013c), p6

**Table 1: Coal industry claims in context**

	Industry claim	Placed in context
Spending and output	Directly spent over \$12.8 billion on goods and services, wages and salaries, local government payments and community contributions in NSW during 2012-13	In the NSW economy with a GSP of \$476 billion, this contribution is modest. The industry's output accounts for two to three per cent of GSP.
Business support	Supports over 10,500 businesses throughout NSW	NSW has a count of more than 680,000 businesses, meaning the mining industry contributes to 1.5 per cent of them. <sup>49</sup>
Exports	Is the state's largest export industry (by value)	Coal represents some 22 per cent of NSW international exports. Profits earned are also exported, however, because the industry is 90 per cent foreign owned.
Employment	Employs 53,745 people	Over 3.6 million people are employed in NSW. <sup>50</sup> The mining industry accounts for 1.4 per cent of NSW employment.
Royalties	Generated \$1.3 billion in royalties in 2012-13, with \$7.4 billion forecast over the next four years.	This represents less than two per cent of total NSW Government revenue.

To maximise its political influence, the NSW mining industry produces regular economic reports that present economic data in ways to present the industry in a favourable light. The NSW Minerals Council produces an annual *NSW Mining Industry Economic Impact Assessment*,<sup>51</sup> the results of which are released over a period of months, ensuring a stream of good economic news. Most mines also produce and publicise their own economic assessments, emphasising their own importance and that of the wider industry.

Among economists there is little debate that the Hunter economy is diverse and that the role of the coal industry is focused on output and exports, but peripheral to other aspects of the economy. In a study conducted for Regional Development Australia – Hunter, Deloitte Access Economics (DAE) modelled a scenario where coal prices declined by 30 per cent on 2012-13 prices and remained at low levels to 2036. Such a scenario would “significantly reduce profitability across the mining sector and the string of related industries”.<sup>52</sup> Despite this, DAE found that output in the Hunter changed by only between 0.2 per cent and four per cent compared to their business-as-usual scenario. Commenting on this ‘relatively modest’ impact, the authors said:

*The reach of the mining sector is broad, with many of the supporting functions between the mine gate and export terminals undertaken by businesses based in the [Upper]<sup>53</sup> Hunter. A tapering off in commodity prices and a subsequent reduction in mining production would therefore adversely impact economic activity in the area. However, output decreases in the more diverse and service intensive lower Hunter are more modest, declining by around 0.6 per cent in 2025 and 0.9 per cent in 2036.*

<sup>49</sup> ABS (2011a) *State and Territory Statistical Indicators, 2011 - Count of Businesses*

<sup>50</sup> ABS (2014) *Labour force December 2013* 6202.0

<sup>51</sup> Lawrence Consulting (2013); NSW Minerals Council (2012)

<sup>52</sup> Deloitte Access Economics (2013), p48

<sup>53</sup> This reads as “lower Hunter” in the original, but appears to be a typo as it compares the “lower Hunter” with the “more diverse lower Hunter”.

*Indeed, non-resource and trade exposed sectors such as tourism and education services are set to benefit from a depreciation in the Australian dollar [which accompanies the modelled lower commodity prices] – effectively becoming more competitively priced relative to other international destinations.*

In other words, the Hunter economy has many sectors that do not heavily depend on the coal industry. Some of these sectors, such as tourism and education, are in fact being negatively affected by the exchange rate effects of the mining boom and would benefit from conditions that negatively affect the coal industry.

DAE's modelling suggests that even with a substantial hit to profitability, the major producers would remain in the Hunter and continue producing coal. This is not a surprising finding, as the ABS recently estimated that the coal industry operates at a profit margin of 24.3 per cent.<sup>54</sup> While smaller and more speculative projects may close or not begin, the major operations are strongly profitable on their existing assets. This is in contrast to industry claims that minor changes have "implications for the viability of the mining sector".<sup>55</sup>

While DAE predicts modest impacts on output from tough coal market conditions, it found impacts on overall Hunter employment would be minimal. Its model showed changes from the baseline of between zero and 1.2 per cent depending on the sub-region and the year. This highlights that despite its apparent size, the Hunter mining industry doesn't actually employ many people and isn't responsible for large numbers of 'indirect jobs'.

As DAE's modelling suggests that a large, sustained hit to the resource sector is unlikely to have major impact on the wider Hunter economy, relatively small changes will have practically no effect. Changes such as the federal mining tax, the recent mining State Environment Planning Policy amendment and the rejection of particular projects would have a negligible effect on the Hunter economy. Claims that a particular project will have a major impact on the overall economy should therefore be treated with scepticism.

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<sup>54</sup> ABS (2013b)

<sup>55</sup> Rio Tinto (2013) *Coal & Allied appeals Warkworth extension rejection*

## Conclusion

Its advocates portray the Hunter Valley coal industry as ‘vital’ to the state and regional economy. This misrepresents the economic contribution of the coal industry. Economic assessments of the Hunter emphasise its diversity and lack of dependence on any sector in particular. While the Hunter produces large amounts of coal and accounts for a considerable proportion of NSW exports, coal’s contributions to Hunter employment and NSW public finances are modest. Ninety-five per cent of the Hunter’s workforce does not work in mining and only two per cent of NSW government revenue comes from mineral royalties.

The Hunter coal industry is, however, a powerful player in NSW politics. Much of this power comes from the perceived role of the industry in the state’s economy, a perception fed by regular economic reports paid for by mining companies and their chief lobby group. These reports seem to be successful in influencing public opinion.

Polling conducted for this research shows that, on average, respondents think that:

- The coal industry employs four times as many people as it does.
- The coal industry contributes ten times as much to state finances as it does.
- The coal industry has considerable Australian ownership, when in fact it is 90 per cent foreign owned.

The coal industry’s downsides are difficult to hide. Impacts on air quality, health, water, bushland and other industries are perceived as being a strongly negative factor by respondents. Attempts to mitigate and rehabilitate the industry’s impacts are widely seen as unsuccessful.

Respondents’ impressions of negative impacts suggest that even though their impressions of the coal industry’s economic role are inflated, only 37 per cent feel that the industry’s benefits outweigh its costs. Eighty-three per cent of Hunter residents do not want to see the industry expand, while 41 per cent would like to see it decrease or be phased out. If the public were better informed about the actual role of the industry, it seems likely that still more people would prefer a Hunter Valley with less coal production.

Modelling of the Hunter economy suggests that long-term adverse effects on the coal industry will have a minimal impact on employment and output. The people of the Hunter Valley, and NSW decision makers, should realise that an ever-expanding coal industry is not required for the economic future of the Hunter. Stopping the expansion of the Hunter coal industry and beginning to reduce output levels will not cause widespread unemployment or problems for state finances. It would, however, contribute to improvements in air quality and other health and environmental impacts and bring benefits for non-mining industries – benefits that, in the view of most respondents, would outweigh the minor costs.

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## Appendix: Transcript of survey questions

A1. Firstly, are you over the age of 18?

- Yes
- No (Terminate)

Q1. Thinking about coal mining. Approximately what percentage of workers in the Hunter Valley and Newcastle do you think work in the coal mining industry?

- Press 1 for less than 10%
- Press 2 for 10%-20%
- Press 3 for 21%-30%
- Press 4 for more than 30%
- Press 5 if you are unsure
- Press 6 to hear this question again

Q2. Approximately what percentage of NSW state government revenues do you think are from coal royalties?

- Press 1 for less than 10%
- Press 2 for 10%-20%
- Press 3 for 21%-30%
- Press 4 for more than 30%
- Press 5 if you are unsure
- Press 6 to hear this question again

Q3. What effect do you think coal mining has on air quality and human health in the Hunter Valley and Newcastle?

- Press 1 for no effect
- Press 2 for a negative effect
- Press 3 for a positive effect
- Press 4 if you are unsure
- Press 5 to hear this question again

Q4. What effect do you think coal mining has on other industries such as agriculture, vineyards, horse studs and tourism in the Hunter Valley?

- Press 1 for no effect
- Press 2 for a negative effect
- Press 3 for a positive effect
- Press 4 if you are unsure
- Press 5 to hear this question again

Q5a. What effect do you think coal mining has on water and bushland in the Hunter Valley?

- Press 1 for no effect
- Press 2 for a negative effect
- Press 3 for a positive effect
- Press 4 if you are unsure
- Press 5 to hear this question again

Q5b. The mining industry has various mitigation measures that can be applied to avoid or reduce the environmental impacts of coal mining. Do you think these measures leave the Hunter Valley environment in a better or worse condition after coal mining?

- Press 1 for better than before
- Press 2 for the same as before
- Press 3 for worse than before
- Press 4 if you are unsure
- Press 5 to hear this question again

Q6. Do you think the economic benefits of coal mining in the Hunter outweigh any potential effects on health, the environment and other industries?

- Press 1 for Yes
- Press 2 for No
- Press 3 if you are not sure
- Press 4 to hear this question again

Q7. Approximately what percentage of Hunter Valley coal mining do you think is Australian owned?

- Press 1 for less than 25%
- Press 2 for 25% to 49%
- Press 3 for 50% to 75%
- Press 4 for more than 75%
- Press 5 if you are unsure
- Press 6 to hear this question again

Q8. Over the long term, would you like to see levels of coal mining in the Hunter Valley...?

- Press 1 for increase
- Press 2 for stay about the same
- Press 3 for decrease
- Press 4 phased out
- Press 5 if you are unsure
- Press 6 to hear this question again

Z1. Which gender are you?

- Press 1 for male
- Press 2 for female

Z2. Which industry best describes the job you do?

- Press 1 for Agriculture, Forestry and Fishing
- Press 2 for Mining
- Press 3 for Manufacturing and construction
- Press 4 for Retail or wholesale trade
- Press 5 for Hospitality and tourism
- Press 6 for Health, education, community or public service
- Press 7 for some other industry

- Press 8 for if you are not currently employed
- Press 9 if you are unsure

Z3. How old are you?

- Press 1 if you are under 18 years old (CLOSE)
- Press 2 for 18 to 24 (CLOSE)
- Press 3 for 25 to 34
- Press 4 for 35 to 49
- Press 5 for 50 years to 64
- Press 6 for 65 years or older

Z4a. Are there any people in your household aged 18-34 who are eligible to vote who are at home at the moment?

- Press 1 for yes
- Press 2 for no (CLOSE)

Z4b. Could you please put this person on the phone? We would love to hear from this person.

- Press 1 for yes (REPEAT FROM A1)
- Press 2 for no (CLOSE)