# 2 The nature of resource exploration and the role of government

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| **Key points**   * Minerals and energy resources exploration represents a small share of the economy (0.5 per cent of GDP in 2011‑12), but is an essential prerequisite for mining and energy resource extraction (9 per cent of GDP in 2011‑12). * Expenditure on exploration has increased substantially over the last half decade, to reach $7 billion in 2011‑12. * Much of this increase has been driven by brownfield exploration (exploration in established reserves). * Greenfield exploration (exploration in unexplored and incompletely explored areas) has remained stable. * The economic performance of resource explorers has been falling due to higher costs and lower rates of discoveries. One indication of the decline in exploration productivity is that the cost per metre drilled (in real terms) has increased. Moreover, exploration expenditures have not led to as many discoveries over the last decade as in previous periods. This is particularly the case for the discovery of ‘giant’ deposits. * If the downward trend in significant discoveries continues, resource extraction will increasingly rely on deposits which may be of lower grade, deeper in the ground and require more ‘effort’ to extract. This will impact adversely on Australia’s competitiveness in resource extraction. * The exploration sector is increasingly globalised, with ‘frontier’ countries gaining a rising share of global exploration expenditures. While Australia’s share of exploration expenditures ranks second, behind Canada, Australia is seen increasingly as a ‘mature environment’ with less prospectivity. * The rationale for government involvement in resource exploration stems from: * its ownership of the mineral and energy resources * the need to balance competing land uses * the requirement to manage spill‑overs from exploration * There is a growing belief within the resource exploration industry that regulatory changes are contributing to the decline in attractiveness of many Australian jurisdictions as destinations for exploration. |
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This chapter describes the role of mineral and energy resource exploration in Australia and overviews the industry’s size, structure and recent performance. It also discusses the rationale for government involvement in resource exploration, and provides an overview of the regulatory environment in which exploration operates.

## 2.1 Role and structure of resource exploration

### The importance of exploration

The Australian and New Zealand Standard Industrial Classification (ANZSIC) relating to resource exploration activities and firms engaged in those activities are set out in box 2.1[[1]](#footnote-1). On this basis, mineral and energy resource exploration in Australia is a small part of the economy, equivalent to 0.5 per cent of GDP in 2011‑12 and accounting for just 0.2 per cent of employment since the mid‑1980s (ABS 2012c).

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| Box 2.1 ANZSIC classifications surrounding exploration |
| Mining activities are identified in Division B of the Australian Bureau of Statistics (ABS) Australian and New Zealand Standard Industrial Classification (ANZSIC). The ANZSIC divides mining into two basic activities — mining operations and exploration and other mining support services.  Firms engaged primarily in exploration — or providing services to other resources or other exploration companies — are in subdivision 10 of Division B. Exploration activities (group 101) are further divided into petroleum exploration and mineral exploration.  Petroleum exploration (class 1011) includes units engaged in:   * natural gas exploration * petroleum exploration   Minerals exploration (class 1012) consists of units mainly engaged in exploring for minerals (except for crude petroleum or natural gas).  There are also companies primarily engaged in resource production who undertake exploration activities. These companies will be found under the following ANZSIC subdivisions:   * subdivision 06 coal mining * subdivision 07 oil and gas extraction * subdivision 08 metal ore mining |
| *Source*: ABS (2008). |
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However, these statistics fail to fully capture the importance of exploration. Exploration is a prerequisite for the extraction of commercially valuable mineral and energy resources. Resource extraction is a major contributor to Australia’s overall economic activity, accounting for 9 per cent of GDP in 2011‑12. As current reserves are depleted, the long term viability of resource extraction and its contribution to Australia’s economic growth will be underpinned by the ongoing discovery of high quality deposits.

The Minerals Council of Australia highlighted the importance of exploration by referring to comments by the chief of Geoscience Australia’s Energy and Mineral Division:

While Australia’s resource stocks are healthy overall, the country’s position as a premier minerals producer is dependent on continuing investment in exploration to locate high quality resources and upgrade known deposits to make them competitive on the world market. (sub. 27 p. 17)

### The scope of exploration activity

#### Resource type

Australia is endowed with a wide range of mineral and energy resources, with active exploration occurring across the spectrum of resources. Expenditure on mineral and petroleum exploration has tripled over the past decade to reach $7 billion in 2011‑12 (figure 2.1). Petroleum exploration is the largest component and, until 2008, was the main driver for the substantial increase in overall exploration expenditure.

Expenditure on exploration for gold, silver and base metals has recently returned to the peak level experienced prior to the global financial crisis. Exploration spending on iron ore and coal has also substantially increased in recent years, albeit from a low base.

Figure 2.1 Exploration expenditures have increased substantiallya

1988‑89 to 2010–12, $billion (2011‑12 prices)

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a Exploration expenditure for coal seam gas is included within coal exploration expenditures.

*Data source*: ABS (2012a) (Time Series Workbooks for tables 5 and 6).

#### Location

Exploration activity is unevenly distributed across Australia (figure 2.2). Western Australia and Queensland dominate, accounting respectively for around a half and a quarter of total spending. Tasmania is at the other extreme, with the smallest share, at around 1 per cent. While the disproportionate shares of exploration expenditure across states primarily reflects disparities in mineral endowments, differences in policies and regulatory practices may also play a part.

Figure 2.2 Exploration expenditure across Australiaa

Per cent of total Australian exploration expenditure and land area in 2012

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a Sales and service income.

*Data sources*: ABS (2012a, 2012b).

#### The structure of exploration firms

Mineral and energy resource explorers are businesses of all sizes. At one end of the spectrum are companies with established production operations, billions of dollars in assets and multinational operations. At the other end are small exploration firms with only a few million dollars of capital. It is common practice to divide these companies into those which primarily source their exploration funding from income derived from established mines or wells (the ‘senior’ miners[[2]](#footnote-2)) and those which raise their exploration funding more directly through the stock market (the ‘junior’ explorers).

A recent review of resources companies listed on the stock exchange (table 2.1) highlights that even though junior explorers far outnumber the senior miners, the latter account for the vast majority of resource company market capitalisation.

Table 2.1 Junior explorers are numerous, but have limited capitalisation

Resource explorers listed on the Australian Stock Exchange in June 2012

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| Sector | Juniora explorers | Senior explorers | Junior explorers’ share of all listed resource companies | Junior explorers’ share of total resource company market capitalisation |
|  | number | number | per cent | per cent |
| Oil and gas | 110 | 17 | 87 | 8 |
| Coal and consumable fuels | 63 | 21 | 75 | 22 |
| Aluminium, steel and  diversified minersb | 275 | 78 | 78 | 5 |
| Gold and other precious metals | 189 | 64 | 75 | 19 |
|  |  |  |  |  |
| **Total** | **637** | **180** | **78** | **7** |

a The cut‑off between junior and senior companies is based upon a market valuation of $200 million. b Description used by source material.

*Source*: Williams (2012).

While the market capitalisation of junior explorers is only seven per cent of all explorers listed on the Australian Stock Exchange, they make important contributions to exploration. The Australian Petroleum Production and Exploration Association (APPEA) state:

A number of Australia’s major oil and gas discoveries have resulted from the innovative and pioneering work undertaken by junior exploration companies, while the prospectivity of some basins has been established by the work undertaken by small independent companies at the frontier stage of the exploration cycle. Of more recent times, junior explorers have underpinned the emergence of coal seam gas as an important energy source and the growth of shale gas activities. (sub. 22 pp. 5–6)

Further, junior explorers accounted for just over half of all exploration expenditure for non‑ferrous metals over the last half decade (Schodde 2011).

## 2.2 How the resource explorers operate

Mineral and energy resources need to be located and assessed in order to identify their extent and quality. This requires geological expertise, capital to fund exploration and a measure of luck.

Explorers rely on geological theories, together with evidence of the physical, geological, electromagnetic and chemical characteristics of locations (including data from previous exploration and extraction activities), to identify likely sites for investigation. These theories and data provide the basis for preliminary assessments of the relative geological potential (or prospectivity) of different possible exploration locations. Geological theories are re‑evaluated and adapted in light of the success or otherwise from exploration activity.

There are several interrelated, and usually sequential, stages in the mineral exploration process. Exploration usually begins with a review of existing geoscientific data to identify appropriate locations to explore (generative stage). Once broad areas have been identified, techniques such as aerial surveys, surface level chemical testing and geological mapping are used to identify the most prospective areas for drilling.

The next stage is usually target drilling — which is an attempt to intersect with a mineral or energy resource. Even though the location for target drilling is based on the results of initial testing, the probability of successfully identifying resources is low. As such, target drilling usually involves lower cost drilling activities (such as drilling to limited depths and/or dispersed drilling).

If target drilling identifies the existence of a resource, explorers may move on to the evaluation stage. This would involve more concentrated drilling (known as pattern drilling) and/or to deeper drilling along with drilling techniques that enable better estimates about the depth, grade and consistency of the deposit. If the results of drilling during the evaluation stage are positive, explorers will then begin feasibility studies to determine if a profitable mine or well can be established.

At each stage, explorers use the information they have gathered to make judgements about the risk‑weighted costs and benefits of continuing to the next exploration stage and about whether they should hold or relinquish tenements or delay their exploration and development activities. A particular site may be explored multiple times using different techniques and approaches before a discovery is made.

Most exploration activities can be categorised into greenfield or brownfield exploration:

* *Greenfield exploration* occurs in unexplored or incompletely explored areas and is directed at discovering new resource deposits. This exploration is a high risk, and potentially high reward venture with large returns possible for those which successfully discover substantial viable deposits. This approach appeals to junior mining companies which often on‑sell significant commercial discoveries, or form joint ventures to exploit the resources.
* *Brownfield exploration* relates to activity in areas with established reserves. This is often undertaken by major companies adjacent to their existing mines to better define the quantity or quality of known resources. This may enable them to extend the operating life of an existing mine and better utilise their infrastructure or use it for longer.

## 2.3 Performance of resource explorers

Industry group submissions have raised a number of concerns about the economic performance of resource explorers in Australia (QRC‑QEC, sub. 13; APPEA, sub. 22; AMEC, sub. 24; AMMA, sub. 32) including:

* that the cost of undertaking exploration is rising too rapidly (subs. 13, 22, 24, 32)
* the rate of discovery of significant new resources is declining (subs. 22, 24) resulting in doubts over the long term sustainability of resource extraction (subs. 13, 22)
* a decrease in greenfield exploration as a share of the total (subs. 22, 27)
* that exploration activity in Australia is not keeping pace with overseas activity (subs. 22, 32).

Each of these concerns are examined below.

#### Exploration has become increasingly costly

The competitiveness of resource exploration is a key factor in attracting investment and improving the potential for discovering resources. Australia has always been a costly location to explore due to high transport costs, a harsh and limited exploration season in many places and a very weathered terrain which can result in deposits being covered by a large overburden. Offshore petroleum exploration also suffers from Australia’s distance from the world’s major petroleum centres which inflates the costs of mobilising drilling rigs and equipment.

A simple partial measure of the cost competitiveness of exploration activity is the cost per metre drilled. In this regard, as noted earlier, exploration expenditure in real terms has increased significantly over the past decade, but the actual metres drilled have not increased at the same rate. The cost per metre drilled for minerals and coal has risen since 1997, and for petroleum exploration it has been rising since the mid 2000s (figure 2.3). This points to a decline in exploration sector productivity. AMEC also refers to the declining cost competitiveness of exploration against international counterparts (sub. 24 p. 5).

Figure 2.3 The cost of drilling is increasing

1988 – 2012 $ per metre drilled (2012 prices), year ending June

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*Data sources*: ABS (2012a); Geoscience Australia (2011a).

#### The rate of significant new resource discoveries is declining

An indicator of successful exploration activity is the number and size of discoveries that result from exploration expenditure. In this regard the performance of the sector has been declining. The Minerals Council of Australia state:

Whereas in the 1980s and 1990s more than 10 significant deposits were found each year on average, only 43 significant deposits were found over the decade between 2000 and 2010. Excluding bulk commodities, Australia’s discovery rate has roughly halved over the decade despite increased exploration expenditures. (sub. 27 p. 17)

The decline in giant and major mineral discoveries has been particularly marked over the most recent decade (figure 2.4). This decline in discoveries has occurred despite a sharp increase in exploration expenditure.

Figure 2.4 The number of giant and major discoveries is falling as exploration expenditure has risen

Number of giant, major and moderate mineral discoveriesa and explorationb expenditure: 1988–2012

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a Moderate — Greater than: 100koz Au; 10kt Ni; 100kt Cu equivalent or 5kt U3O8.; Major — Greater than: 1 million oz Au; 100kt Ni; 1 million tonnes Cu equivalent or 25kt U3O8; Giant — Greater than: 6 million oz Au; 1 million tonnes Ni; 5 million tonnes Cu equivalent or 125kt U3O8. b Excludes iron ore, coal and petroleum.

*Sources*: ABS (2012a); Schodde and Guj (2012).

The Minerals Council submission presents evidence that the decline in discoveries is not a global trend. According to the MinEx analysis (quoted in the Minerals Council of Australia submission: sub. 27), Australia’s share of the Western World’s giant discoveries has fallen from around 17 per cent in the 1980s to around 6 per cent in the 1990s. Given the increasing emphasis in recent decades on exploration in such regions as Africa and central Asia, it is likely that the MinEx analysis understates the relative decline in discoveries in Australia.

This decline in the rate of discovery has implications for future resource extraction. Based on current extraction levels, nearly half of the larger operating mineral mines — those mines with extraction levels of over one million tonnes per year (18 of 41 mines) — would exhaust their resource deposits by 2025 (Schodde 2011). This pattern is more pronounced in sectors such as gold and less in sectors such as coal or bauxite. The significant new gas discoveries would not be exhausted by that date.

The life of reserves does not represent an absolute limit to economic viability. While reserves may last many years, remaining deposits may be of lower grade, in more remote locations, deeper in the ground, mixed with greater impurities and require more difficult extraction techniques. This trend in falling ore grades across several metals is demonstrated in figure 2.5.

Figure 2.5 Combined average ore grades over time for base and precious metals

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| **Figure 2.5 Combined average ore grades over time for base and precious metals. This figure shows the ore grades of precious metals from 1840 to 2010.** |

*Data source*: Adapted from Mudd (2007, p. 119).

More input ‘effort’ is needed to produce a unit of output from lower grade reserves. This has been identified as one reason for the fall in productivity growth in Australian mining over the last decade (Topp et al. 2008).

The main factor put forward to explain the decline in the rate of discoveries is Australia’s mature exploration environment. The Policy Transition Group (PTG 2010) observed:

In Australia there has been a decline in the success rates and average size and quality of deposits discovered. This could reflect Australia’s ‘mature’ environment, with very few major near‑surface mineral deposits remaining, and new ‘buried’ deposits involving a lower chance of discovery and a higher cost of extraction. (p. 10)

Cory (2012) explained the decline in exploration success in similar terms:

The decline in exploration success is in large part due to the difficulty in exploring what lies beneath the regions of highly weathered rock (known as regolith) and sedimentary basins that cover approximately 80 per cent of Australia. (p. i).

AMEC support this view of Australia’s declining prospectivity:

The industry is also facing an environment where discoveries are reducing, getting deeper and harder to find … (sub. 24 p. 5)

As does APPEA in relation to petroleum:

Australia is generally perceived to offer low prospectivity for oil, with relatively low discovery rates and small average field sizes. Gas prospectivity is good, but Australia has many large undeveloped gas fields and resources, and new gas discoveries are often remote from markets and infrastructure, and are becoming increasingly difficult to commercialise. (sub. 22 pp. 4‑5)

#### A decreasing share of greenfield exploration

Concerns have been raised about the relative shift to brownfield exploration (figure 2.6). Some participants consider that this will reduce the likelihood of making major resource discoveries. APPEA state:

By not exploring or drilling wells in more remote and frontier areas, companies are much less likely to find the larger and material discoveries. Overall, this will lead to a longer term decline in field development and production through the discovery of smaller and smaller fields. (sub. 22 p .9)

The Minerals Council of Australia refers to ‘a profound decrease’ in the ratio of exploration dollars committed to greenfield compared to brownfield programs’ (sub. 27 p. 18). The Council goes on to quote Schodde and Guj (2012) stating:

The gradual shift of funding from greenfield to brownfield exploration, while understandable in terms of short‑term profitability, is worrying as in the long‑run it will affect the metal contribution to the national resource inventory and with it the sustainability of the Australian mining industry. (p. 23)

While the share of greenfield exploration expenditures has been declining, there has been no appreciable fall in expenditure or activity in greenfield exploration in recent years (figure 2.7). Indeed, greenfield exploration expenditure is higher in real terms than a decade ago.

Moreover, the recent increase in brownfield exploration may have been primarily driven by higher commodity prices during the last decade, and may be short lived. As Whiting and Schodde (2006) have hypothesised, given the long lead times for developing a new mine, it is difficult for miners to exploit booms in commodity prices by making new greenfield discoveries:

Given that the average business cycle is of the order of five to seven years, it is very difficult to confidently schedule the start of a grassroots exploration program to deliver metal into the market at the top of the business cycle. (p. 48)

Figure 2.6 Mineral explorationa — greenfield and brownfieldb

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| exploration expenditure |
|  |
| metres drilled |
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a ABS data on metres drilled is not available for petroleum exploration. b Exploration in existing areas includes evaluation drilling on production leases.

*Data sources*: ABS (2012a); Geoscience Australia (2011a).

#### International competition for exploration expenditure and activity

Australia accounted for the second largest share of exploration expenditure for non‑ferrous minerals in 2012 (figure 2.7). Despite this high ranking, there is evidence that Australia has become a relatively less attractive region to explore over the last decade. For example, Australia’s share of world non‑ferrous mineral exploration expenditure has fallen from around 20 per cent in the mid‑1990s to 13 per cent in 2011 in non‑ferrous mineral exploration (figure 2.8).

The Policy Transition Group (2010) also noted a trend towards overseas exploration rather than exploration in Australia. They refer to perceptions that Australia was becoming less prospective relative to ‘frontier’ countries and that the higher cost of doing business in Australia was due in part to higher operating costs and to an increasing regulatory burden (PTG 2010).

Figure 2.7 Canada and Australia are global leaders in mineral exploration

Share of world non‑ferrous mineral exploration budgets, 2012

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*Data source*: Marshall (2012).

Figure 2.8 Australia’s share of global non‑ferrous mineral exploration

1991–2011, excludes iron‑ore and uraniuma

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a 2011 world expenditure estimated as 50 per cent higher than in 2010 (figure from World Exploration Trends 2012).

*Data sources*: ABS (2012a) (Time Series Workbooks for tables 5 and 6); Huleatt and Jaques (2009); MEG (various years).

Australian exploration companies have themselves become more involved in overseas locations, as junior explorers consider they have increased ‘stock market appeal’ if they are seen to be active in Africa or South America (EIGWG 2012). The Minerals Council of Australia estimates that half of the locally raised exploration funds are now spent overseas, particularly in developing countries that have stable governments and attractive mining and taxation policies (sub. 27, p 19).

## 2.4 Government involvement in the exploration sector

### Rationale for government regulation of exploration

#### Resources are owned by the Crown

Governments in Australia have a fundamental reason to be involved in exploration — they are the representatives of the owners of mineral and energy resources — the Australian people. As such, the Australian, state and territory governments have a responsibility to ensure that the nation’s mineral and energy resources are managed in a manner that promotes the community’s wellbeing.

Governments require information about the location and nature of these resources in order to make informed decisions about their best use. Consequently, governments have established legal frameworks outlining when and where exploration can occur, and on what basis.

#### Competing land uses

Exploration licences provide explorers with exclusive rights to search an area for the presence of (typically sub‑surface) mineral or energy deposits. Exploration often occurs on land that is currently being used for other purposes, such as farming, or has heritage and environmental importance.

While some exploration activities are minimally invasive (most notably satellite or aerial analysis), more intensive exploration activities can impinge on local communities and on the activities of other land users. For example, exploration activities can temporarily disturb agricultural soil in their immediate vicinity or can increase the level of dust that is lodged in grain and fibre, which could lower the grade and price of the produce.

Governments have established regulations and procedures to resolve or arbitrate on issues arising from competing land uses.

#### Negative spill over effects

Exploration for mineral and energy products can have undesirable unintended consequences, or spill over effects, beyond the immediate area of exploration, including:

* environmental damage
* reduced amenity value for nearby residents
* damage to items of heritage value
* adverse impacts on the operation of other commercial enterprises.

The likelihood and extent of unintended outcomes from exploration are likely to vary according to the flora, fauna and geological characteristics of each potential exploration site. The proximity to human habitation or businesses will alter the likely impact on amenity values (such as noise and dust emissions) and/or the risk of interrupting other business activities. Much of the regulatory framework under which exploration activity occurs is designed to address, avoid and rectify such unintended consequences.

### Policy levers available to governments

Governments have a number of policy levers to influence the overall level and nature of exploration. These levers can act to either increase or lower the ‘reward to risk ratio’ for exploration activities. The levers include:

* *Availability of, and access to, land*. Governments, in controlling large tracts of Crown land and in regulating the use of private land, can influence what land is available for exploration activity and what conditions apply where exploration is allowed. There are also legislative requirements set by governments relating to access to land where native title exists.
* *Regulation of exploration*. This involves providing licences to undertake exploration and establishing the terms and conditions of these licences. Increasingly, the regulation of exploration activities focusses on environmental impacts, native title and heritage protection.
* *Geoscience*. Government provision of pre‑competitive geological information such as geoscience maps, databases and information systems can facilitate exploration by identifying potentially prospective locations.
* *Skilled labour*. Governments can influence the provision of skilled labour through the tertiary education system and migration programs.
* *The taxation treatment of exploration activities*. Tax deductions and incentives relating to exploration activities reduce the cost and raise expected returns, whereas taxation of extraction may have an upstream dampening effect on exploration.
* *Subsidies to exploration activities*. Governments can provide direct subsidies to exploration activities, for example, through government funded drilling programs and co‑drilling programs in partnership with exploration companies.
* *Support for innovation*. Governments can provide support for innovation in exploration activities, such as through the funding of Cooperative Research Centres associated with developing exploration technologies.

### Explorers views of regulation

The nature of the regulatory framework and regulator behaviour can play an important role in shaping the structure of incentives faced by explorers. Equally, other stakeholders have views on the adequacy of regulation to deliver on a range of other social, economic and environmental objectives. These views are canvassed in the relevant chapters in this report.

A Canadian research group — the Fraser Institute — has been undertaking annual surveys of mining companies to examine the relative attractiveness of different jurisdictions and has developed a Policy Potential Index (PPI)[[3]](#footnote-3) (Wilson et. al 2013).

The Fraser Institute surveys suggest that regulatory change and governance in Australia are impinging on the attractiveness of many Australian jurisdictions as destinations for exploration. Compared to the 60 jurisdictions that have been included in every Fraser Institute survey, New South Wales (ranked 33/60 in 2012‑13), South Australia (18/60) and Tasmania (38/60) have failed to maintain their relative attractiveness for mining companies over recent years. Only Western Australia (13/60) has unambiguously improved its ranking. The rankings of the Northern Territory (20/60 in 2012‑13) and Queensland (27/60) show no trend over recent time.

The Fraser Institute highlights the following quote about resource exploration in Australia:

Across Australia, political and regulatory panic is seriously impacting the quality and timeliness of decisions, and certainty about access to land is very concerning. The ‘Twitter’ factor is determining political attitudes and actions, and regulators are reacting to minimize the perceived ‘risk exposure’ of their ministers.

— An exploration company, Company president. (Wilson et al. 2013 p. 39)

Industry concerns with the regulatory framework are echoed in several submissions from explorer peak bodies:

The underlying theme in AMEC’s submission is that regulatory barriers through time and cost reduce the quantity of minerals exploration in Australia. If governments can reduce these barriers Australia would be able to increase efficiency and productivity and ultimately the amount of exploration. (AMEC 2013 sub. 24 p. 7).

Recent years have brought NSW explorers a significant increase in legislative and policy requirements, as well as administrative expense. There is evidence that these issues have already deterred exploration in NSW, with explorers moving to other states and more favourable international jurisdictions. (NSW Minerals Council sub. 3 p. 3)

There is considerable opportunity to update Australian regulatory practice to reflect the significant advances in industry performance and capability that have occurred in recent decades. (AusIMM sub. 12, p. 5)

The Minerals Council of Australia referred to a number of other business surveys of the mining sector reiterating the view that regulatory burdens have increased:

Grant Thornton’s *Mining Business Outlook Report 2013* … concluded that increased regulation has ‘dampened the enthusiasm’ of international investors in the Australian mining sector. (sub. 27 p. 21)

Baker & McKenzie’s report, *Mining investment: local challenges ‑ global implications*, similarly reported ‘a growing perception amongst the industry of a complex maze of green and red tape’ in Australia. (sub. 27 p. 21)

Explorers have identified a range of regulatory barriers that they see as impinging on the efficiency and effectiveness of the exploration industry. This report examines the impact of these non-financial regulations on exploration to determine if existing regulations are consistent with the principles of best practice regulation or, if they are inconsistent, to examine the scope for beneficial reforms.

1. For the purposes of this inquiry, extractive and quarrying industries (ANZSIC subdivision 09) are out of scope and have been excluded from the statistical analysis. [↑](#footnote-ref-1)
2. While senior miners also obtain funding through the stock market, this is typically for developing new mines or acquiring other companies rather than to fund an exploration program. [↑](#footnote-ref-2)
3. The PPI is a composite index that captures the opinions of managers and executives of mining companies on issues such as uncertainty concerning the administration, interpretation, and enforcement of existing regulations, environmental regulations, regulatory duplication and inconsistencies, taxation, uncertainty concerning disputed land claims and protected areas, infrastructure, socio economic agreements, political stability, labour issues, the geological data base, and security. [↑](#footnote-ref-3)