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# Corporate Structure, Capital Raising and Taxation

# **Corporate Structure**

# **Majors and Juniors**

- 3.1 In general, the corporate entities that comprise the Australian resources industry fall into three size-categories. These are:
  - major companies, generally global corporations with large production interests and substantial exploration budgets (majors);
  - middle ranking companies with smaller production interests and modest exploration budgets (mid-tier); and
  - small exploration companies and implicitly non-producers (juniors).¹
- 3.2 The Committee noted that the generic terms majors and juniors are used in both petroleum and minerals sectors, but with slightly different definitions. The terms are used extensively throughout this and following chapters for both sectors using sector-specific definitions respectively.

Andrew Crooks, *Submission No. 80*, p. 1118; The Chamber of Minerals and Energy of Western Australia Inc., *Submission No. 78*, pp 1076-77; Geoscience Australia, *Submission No. 53*, p. 644.

#### Minerals and Petroleum

3.3 There are significant differences in the styles of minerals exploration programs and petroleum exploration programs. Exploration rights allocation, exploration expenditure magnitudes and patterns, corporate alliance, technology, and financing aspects tend to show sector-specific features; and in production royalty and taxation regimes are applied differently. Also, the global maturity of the two sectors varies. Hence, the discussions in this chapter on corporate structure, capital raising and taxation, are dealt with separately for the two sectors.

# Structural Change in the Minerals Sector

- 3.4 The Chamber of Minerals and Energy of Western Australia stated that the three minerals sector company size-categories could notionally be defined by market capitalisation as follows:
  - majors greater than \$1 billion;
  - mid-tier \$200 million to \$1 billion; and
  - juniors less than \$200 million.<sup>2</sup>
- 3.5 The Minerals Council of Australia pointed out some important qualifications to this fairly arbitrary classification:
  - market capitalisation does not include unlisted companies;
  - many junior exploration and production companies are owned or controlled by majors;<sup>3</sup> and
  - although the numeric concentration is in the junior category, around 80 per cent of all exploration expenditure is spent by the majors.<sup>4</sup>
- 3.6 The Australian minerals exploration sector has experienced significant changes in its structure over the last decade, with rationalisation accelerating over the past five years, as a consequence of global consolidation of the resources industry.<sup>5</sup> The global majors have systematically absorbed many of the middle ranking minerals companies around the world including most of the mid-tier Australian exploration and mining companies, in a process known as globalisation. BHP Billiton
- 2 The Chamber of Minerals and Energy of Western Australia Inc., Submission No. 78, pp 1076-7.
- 3 Minerals Council of Australia, *Submission No. 81*, p. 1145.
- 4 Minerals Council of Australia, *Submission No. 81*, p. 1177.
- 5 Geoscience Australia, Submission No. 53, p. 644.

estimated that the total market value of the top five minerals companies as of February 2003 was 45 percent of the market value of the industry (US\$249 billion), almost double the percentage of the top five of 12 years ago.<sup>6</sup>

- 3.7 The Australian Geoscience Council Inc. submitted that "large companies preferred to grow through acquiring smaller companies". The resultant corporate representation in the Australian minerals exploration sector is presently:
  - around twenty global majors and seven Australia-domiciled majors;
  - two or three mid-tier companies; and
  - several hundred juniors.
- 3.8 The resulting picture is of a highly polarised minerals exploration sector comprised of majors and juniors.

## **Implications for Minerals Exploration**

- 3.9 Certain fundamentals of corporate management have changed with the loss of resources company head-offices and associated decision-making functions to overseas locations.
- 3.10 A senior resources industry representative stated that an outcome of the globalisation of the minerals sector was that:

The perspective of a large global minerals company may well coincide with the national interest... but increasingly this will not always be the case. ... There is no over-riding imperative to explore in Australia, either rationally or emotionally; most corporate top leadership in the minerals sector neither resides in Australia, nor is Australian in origin nor is technical in discipline.<sup>8</sup>

3.11 Rio Tinto Exploration and others considered that, through large-scale mergers and acquisitions, a smaller number of major corporations were conducting exploration. In turn this led to diminution in the number of majors who could strategically partner juniors.<sup>9</sup>

<sup>6</sup> Macdonald, James, 2003, *BHP Billiton's Global Exploration Program*, presentation at Geoscience Australia, Canberra, 10 June 2003, (unpublished).

<sup>7</sup> Australian Geoscience Council Inc., *Submission No. 49*, p. 601.

<sup>8</sup> Dr Ian Gould, Submission No. 38, p. 468.

<sup>9</sup> Rio Tinto Exploration, *Submission No. 46*, p. 562; City of Kalgoorlie-Boulder, *Submission No. 47*, p. 569.

- 3.12 Other consequences of sector rationalisation were the post-merger reduction in aggregate exploration budgets and the resultant retrenchment of professional staff. 10
- 3.13 A typical example of post-merger budget reduction occurred when the US company Newmont Mining Corporation took over Australia's Normandy Mining in February 2002. The Committee was told by the South Australian Chamber of Mines and Energy Inc. that the combined pre-merger annual budget for the two companies was \$US 111 million. Post-merger the budget had dropped to \$US 73 million.<sup>11</sup>
- 3.14 Regarding the issue of retrenchment of exploration geoscientists and support staff, it was reported in June 2003 that MIM Holdings' 125 strong exploration unit was set to be disbanded on the company's takeover by the Swiss-based resources company Xstrata International.<sup>12</sup>
- 3.15 Global majors are more willing and able to cut exploration projects, terminate exploration strategies quickly, and withdraw exploration funds and personnel from Australia and divert them to other countries.<sup>13</sup>
- 3.16 Rio Tinto Exploration stated that major minerals companies largely control access to brownfields opportunities, whereas juniors are usually involved in greenfields exploration, or in the evaluation of small discoveries that did not meet the investment hurdles of the majors. Majors therefore played an important role in providing seed opportunities to juniors by passing-on to them mines or projects.<sup>14</sup>
- 3.17 Greenfields (high risk) exploration has declined significantly in recent years and companies are tending to direct the bulk of their efforts now at brownfields targets. Drilling contractor Drillex estimated that its drilling contracts book was currently running at 4:1 brownfields to greenfields, the reverse of the ratio five years ago.<sup>15</sup>
- 3.18 Deloitte Touche Tohmatsu argued that the focus on brownfields exploration arose from recent acquisitions of many Australian (mid-tier) producers by international resources companies:

<sup>10</sup> Australian Geoscience Council Inc., Submission No. 49, pp 601-2.

<sup>11</sup> South Australian Chamber of Mines and Energy, *Transcript, 12 May 2003*, p. 452.

The Australian Financial Review, *Xstrata victory an anti-climax*, 25 June 2003, <a href="http://afr.com/articles/2003/06/24/1056449242021.html">http://afr.com/articles/2003/06/24/1056449242021.html</a>, accessed 2 September 2003.

<sup>13</sup> Minerals Council of Australia, Submission No. 81, p. 1144.

<sup>14</sup> Rio Tinto Exploration, Submission No. 46, p. 562.

<sup>15</sup> Drillex, Transcript, 31 October 2002, p. 191.

a return on these investments will be expected in the short term by shareholders of these international mining companies.

There will be pressure to return a significant portion of profits as dividends to justify the cost of the investment. It is likely that exploration efforts by these companies will be restricted to regional focus of enhancing lifespan of existing production facilities and a focus will not be made on grassroots exploration.<sup>16</sup>

3.19 Brownfields exploration activity was a short-term risk-averse strategy that can generally only boost resources inventories incrementally. As Geoscience Australia observed, greenfields exploration is the lifeblood of the industry. The Similarly, a major company acknowledged that "without greenfields exploration, growth of the mining industry is ultimately limited". Alarmingly, not only has exploration activity declined as a whole in the last five years, but so too has the type of exploration that is most likely to lead to major new discoveries.

#### The Potential of Juniors

3.20 Greenfields exploration is now increasingly likely to be undertaken by juniors, ensuring that Australian-owned companies will retain the responsibility for grassroots exploration and associated industry development. The Commonwealth Bank and others consider juniors to be more efficient explorers who routinely record lower deposit discovery costs than majors. The Chamber of Minerals and Energy of Western Australia advised that, in terms of exploration success, the juniors are responsible for two thirds of the gold discoveries since the 1960s and half of the base metals discoveries, despite spending about a fifth of the total expenditure on exploration. A former CEO of WMC Resources stated

<sup>16</sup> Deloitte Touche Tohmatsu, *Submission No. 12*, pp 89-90.

<sup>17</sup> Geoscience Australia, Submission No. 53, p. 645.

<sup>18</sup> Rio Tinto Exploration, Submission No. 46, p. 563.

<sup>19</sup> Deloitte Touche Tohmatsu, *Submission No. 12*, p. 90; Australian Geoscience Council Inc., *Submission No. 49*, p. 602.

<sup>20</sup> Commonwealth Bank, Submission No. 55, p. 692.

<sup>21</sup> The Chamber of Minerals and Energy of Western Australia Inc., *Submission No. 78*, p. 1077; Abareconomics, *Tax incentive Options for Junior Exploration Companies, abare, eReport 03.4, March 2003*, p. 30.

during a panel discussion on SBS' *The Business Show* that, "bigness" did not necessarily solve the problems of the resources industry.<sup>22</sup>

3.21 Newmont Australia stated that:

the junior sector is critically important to us anyway. You need the diversity of thought, different ideas and different people working in different areas.<sup>23</sup>

- 3.22 However, an experienced exploration manager warned that future exploration programs aiming at major discoveries beneath thick cover on the Australian continent are likely to require high-cost sophisticated exploration technology, which only majors or very well resourced juniors could afford to undertake.<sup>24</sup>
- 3.23 The Committee accepts that future world-class deposit discoveries in Australia are likely to require large injections of exploration investment capital to overcome the technical challenges of locating bedrock deposits on the Australian continent, most of which is obscured by cover material. Raising the necessary capital may well be beyond the capabilities of juniors, even though they may be efficient explorers. The Committee's recommendations to improve access by juniors to capital are discussed later in this chapter. Recommendations to increase pre-competitive data acquisition which can be used by majors and juniors alike are examined in Chapter 4.

#### **Petroleum Sector Structure**

- 3.24 The structure of the Australian petroleum exploration sector differs markedly from its minerals sector counterpart. This is a consequence of the global petroleum sector's relatively mature global structure and some fundamental operational and regulatory contrasts in the ways the two sectors do their business. As well as the maturity factor, the petroleum exploration sector is characterised by:
  - extremely high exploration expenses ("with a single offshore exploration well typically costing \$8-10 million");
  - on-shore and off-shore exploration project exclusivity;

<sup>22</sup> Hugh Morgan AC, *The Business Show*, SBS TV, 20 June 2003, <a href="http://www.sbs.com.au/business/archive.php3?contentID=720&month=6&year=2003">http://www.sbs.com.au/business/archive.php3?contentID=720&month=6&year=2003</a>, accessed 2 September 2003.

<sup>23</sup> Newmont Mining, Transcript, 24 March 2003, p. 396.

<sup>24</sup> John Anderson, Submission No. 31, p. 407.

- title allocation by program bidding;
- profit-based royalty regimes;
- single commodity (hydrocarbons) marketing and global geopolitical and market volatility; and
- the prevalence of vertical integration into refining and retailing, at least by the majors.
- 3.25 Because of an overall long-term declining profitability of the global petroleum industry, there has been significant rationalisation over the last decade. Majors have merged to form even larger super-majors (such as: ChevronTexaco, ConocoPhillips, BPAmoco, ExxonMobil, TotalElfFina). These mergers allow control of very large petroleum fields that can be profitable even at relatively low crude oil prices.
- 3.26 At the same time, successful medium sized petroleum companies have been the subject of hostile takeovers by majors. This corporate predation has depleted the global and Australian market of mid-tier petroleum exploration companies.
- 3.27 Petroleum exploration in Australia has the present structure.
  - about ten global corporations and four Australia-domiciled majors;
  - six to ten mid-tier companies; and
  - a large number of junior explorers. <sup>25</sup>
- 3.28 Historically, the larger offshore petroleum discoveries were made by the majors without significant involvement by juniors. Offshore exploration is expensive, especially in deeper waters, and more technically challenging, and most juniors have traditionally not had the resources to undertake offshore exploration. Instead, they and mid-tier explorers have tended to explore onshore.<sup>26</sup> Approximately 10 per cent of Australian crude oil and 30 per cent of natural gas production now comes from onshore sources.<sup>27</sup>
- 3.29 However, as in the minerals sector, petroleum majors are becoming more risk averse in their Australian exploration. There is now less offshore exploration as the perception is that the chances of major new discoveries

<sup>25</sup> APPEA, Submission No. 39, p. 490; Woodside Energy Ltd, Submission No. 44 p. 542.

<sup>26</sup> Australian Petroleum Production and Exploration Association Limited, *Submission No. 39*, p. 490; Woodside Energy Limited, *Submission No. 44*, p. 542; Geoscience Australia, *Submission No. 53*, p. 672.

<sup>27</sup> Geoscience Australia, Submission No. 53, p. 658.

are low. Instead, the majors are shifting resources to explore overseas in areas of greater perceived prospectivity. The offshore exploration gap is being filled to some extent by the resident major and mid-tier companies, but they too are turning their attention overseas. <sup>28</sup> Juniors continue to play a significant role in onshore greenfields exploration, accepting higher risks and trying new techniques. However, in an indication of how globalised the petroleum exploration sector has become, even some juniors are now exploring overseas as well as in Australia. <sup>29</sup>

- 3.30 A longstanding petroleum sector risk management strategy is the use of joint ventures. Exploration companies establish multi-company joint ventures involving majors and juniors, at the exploration tenement application or bidding stage. In these partnerships, a major usually holds a substantial or even a majority interest in the project with the remaining equity held by other companies including possibly one or more juniors. Generally their target parameters are different and hence the exploration activities of the two groups complement each other. Joint-ventures established at the high-cost exploration stage may also provide the equity mix necessary to fund development, in the event the joint-venture has an exploration success. A fairly typical joint-venture is the Cooper Basin partnership exploring petroleum tenements in South Australia and Queensland. It is made up of a major (Santos Ltd) owning about 60 per cent interest, a mid-tier company (Origin Energy Resources Ltd) owning a 13 per cent interest, and a number of majors and juniors holding the remaining 27 per cent interest.
- 3.31 Australian junior petroleum explorers now tend to operate in a symbiotic relationship with the majors rather than competing with them.
- 3.32 The Australian Petroleum Cooperative Research Centre and the Australian Petroleum Production and Exploration Association Limited (APPEA) both still stressed the importance of a strong junior sector to petroleum exploration in Australia. They argued that action to develop a more active junior sector would benefit petroleum exploration in Australia<sup>30</sup>. The Commonwealth Bank also submitted that there needs to be stimulation of juniors to fill the mid-tier gap.<sup>31</sup>

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<sup>28</sup> Dr CM. Griffiths, *Submission No. 37*, p. 464; Australian Petroleum Production and Exploration Association, *Submission No. 39*, p. 490.

<sup>29</sup> Australian Petroleum Production and Exploration Association, Submission No. 39, pp 490-91.

Australian Petroleum Cooperative Research Centre, *Submission No. 6*, p. 30; Australian Petroleum Production and Exploration Association, *Submission No. 39*, p. 491.

<sup>31</sup> Commonwealth Bank, Submission No. 55, p. 692.

## Strategic Response to Structural Change – Minerals and Petroleum Sectors

3.33 The most significant difference between the structure of the minerals and petroleum sectors is the greater degree of globalisation in the petroleum sector. Juniors in the petroleum sector seem more active at undertaking overseas work and also to operate to their own advantage more closely with the majors. Metex Resources acknowledged the influence of the petroleum sector on minerals in that:

...explorers are required to approach exploration for minerals with a similar frame of mind to drilling oil wells. Targets are deeper, require the acquisition of expensive and complex data sets, and are evaluated using expensive deeper drilling techniques.... This transition from an immature to mature exploration regime is reflected in the lack of significant discoveries in recent years.<sup>32</sup>

3.34 In both sectors there has been corporate polarisation with majors consolidating and buying out mid-tier companies while juniors remain in relatively large numbers. As a further generalisation, majors in both sectors have become more risk averse with a focus on brownfields exploration – in part responding to demands by investors that profits be reflected in dividends rather than being channelled into speculative exploration. As Deloitte Touche Tohmatsu identified succinctly:

Investors who support investing in exploration companies are not generally driven by the desire to seek new frontiers, but see an investment in a resources stock as a means to possibly make a quick profit.<sup>33</sup>

- 3.35 This partial retreat by majors has opened exploration niches for juniors, but also exposed their weaknesses they tend to be efficient, but undercapitalised to handle high risk exploration.
- 3.36 The Committee sees exploration joint ventures as one of the key strategies by which juniors, in both the minerals and petroleum sectors, will survive in an already (petroleum) and increasingly (minerals) internationalised industry. From the juniors' perspectives, joint ventures will spread risk and place them in a position to take advantage of new (and expensive upfront) exploration technologies. In this way majors and juniors should also be able to complement their respective strengths by working together in longer term alliances.

<sup>32</sup> Metex Resources Limited, Submission No. 14, p. 115.

<sup>33</sup> Deloitte Touche Tohmatsu, Submission No. 12, p. 75.

# **Capital Raising**

# **Minerals Exploration Sector**

- 3.37 There is little evidence that the majors have any great difficulty in obtaining capital, as their finance is generally sourced internally.<sup>34</sup> However, individual exploration projects faced internal competition for exploration capital in any major mining (exploration) company, and proposals to explore in Australia were weighed up against options to explore in other countries.<sup>35</sup>
- 3.38 Juniors, on the other hand, tend to source their funds from the speculative end of the equities market.<sup>36</sup> Because juniors typically do not generate regular cash flows they need to rely on external capital sources to provide funds for ongoing activities. It is difficult for juniors to raise funds on the equities markets. Many exploration companies have become moribund or have been wound-up. As AMEC described:

Small explorers are driven by the imperative that they must do sufficient work, in terms of proving up prospective ground, to either underpin further fund raising, supplement float money, or to make their properties attractive to another company that may then joint venture with them. Larger corporations do not have the same short term need to perform, as their ongoing survival is not tied so closely to immediate performance.<sup>37</sup>

3.39 The perceived low probability of adequate return on investment in minerals exploration was the critical factor explaining the present scarcity of equity finance for minerals exploration. Historically, returns from mining and exploration have not matched those of most other asset classes. The Australian Stock Exchange (ASX) Mining Index was 60 per cent higher than it was in 1983 whereas the All Industrials index was 500 per cent higher than it was in 1983.<sup>38</sup>

The Chamber of Minerals and Energy of Western Australia Inc., Submission No. 78, p. 1078.

<sup>35</sup> Rio Tinto Exploration, *Submission No. 46*, p. 563; Queensland Mining Council, *Submission No. 60*, p. 794.

The Chamber of Minerals and Energy of Western Australia Inc., *Submission No. 78*, p. 1078; Deloitte Touche Tohmatsu, *Submission No. 12*, p. 75.

<sup>37</sup> AMEC, The Importance of Implementing a System of 'Flow Through' Shares as a Mineral Exploration Incentive, Briefing Paper, March 2003, p. 7.

Reed Resources Limited, Submission No. 98, p. 1495.

- 3.40 Other reasons identified by witnesses to explain the scarcity of finance for junior minerals exploration companies included:
  - capital markets which were particularly risk-averse at present;<sup>39</sup>
  - the high level of competition for funds from other speculative sectors, such as high-tech, dotcoms and biotechnology; <sup>40</sup>
  - exploration activities cannot be expected to generate positive cash flows for many years;<sup>41</sup> and
  - the problem that juniors' Initial Public Offerings (IPOs) were too small to attract institutional investors.<sup>42</sup>
- 3.41 Despite this, junior minerals companies can still raise finance. However, they must be opportunistic and offer quality tenement portfolios and superior management strategies to succeed in raising equity funding, even at a discount.<sup>43</sup> Windows of opportunity to raise funds from equity markets presented themselves intermittently to junior minerals explorers, usually following new minerals discoveries they or others had made. For example, some recent IPOs were successful arising out of the Olympic Dam style mineral deposit discovery at Prominent Hill (SA), in November 2001.<sup>44</sup>
- 3.42 Heron Resources' decisions to keep overheads low and spend 40 per cent of its annual budget on prospect drilling were well received by equities markets. The company told the Committee that:

if you have a good story, a good company and good ground and targets, you can always raise money. Often it will be at discounted prices, but that is the way the business goes.<sup>45</sup>

3.43 The trend towards widespread investor risk aversion has been interpreted by some witnesses as the manifestation of a new operational paradigm.

The consequences are that:

<sup>39</sup> Newmont Australia, *Submission No. 71*, p. 974.

<sup>40</sup> The Chamber of Minerals and Energy of Western Australia, Submission No. 78, p. 1078.

Abareconomics, *Tax incentive Options for Junior Exploration Companies, abare, eReport 03.4, March 2003*, p. 20.

<sup>42</sup> Geoscience Australia, Submission No. 53, p. 649.

<sup>43</sup> Deloitte Touche Tohmatsu, *Submission No. 12*, p. 75.

<sup>44</sup> Heron Resources Limited, Transcript, 31 October 2002, p. 201.

<sup>45</sup> Heron Resources Limited, *Transcript*, 31 October 2002, pp 200-1.

- investors are seeking better paying asset classes;<sup>46</sup>
- institutions are investing in, and therefore influencing, public exploration companies that pay dividends and are pursuing low-risk strategies;
- the profits from mining are not being fed back into exploration;<sup>47</sup>
- fund mangers are reluctant to invest in juniors because of lack of liquidity and sector representation, and lack of earnings;<sup>48</sup>
- resources sector representation has declined on the Australian Stock
   Exchange from 35 per cent in the 1980s to less than 10 per cent today;<sup>49</sup>
- 3.44 An eminent geologist proposed that, in order to build some sophistication into the assessment of investment risk, qualified analysts should routinely assess proposed exploration program proposals for risk. This would provide an objective basis for risk-sensitive investment decisions. A mining analyst put forward a similar view, noting that capital markets managed by banks, stockbrokers and fund managers used a variety of risk management strategies including hedging to protect their investments. Substantial resources industry corporate losses have occurred in the recent past when risk management strategies were in the hands of inexperienced small company managers. To avoid this damage the mining analyst suggested that risk assessors be adequately resourced. 51

# **Initial Public Offerings (IPOs)**

- 3.45 The problems experienced by some junior companies in raising exploration equity finance could probably be traced back to uncompetitive IPOs. Offshore investment options and competition from other speculative sectors, such as the information technology and biotechnology sectors, had meant that investors were now expecting better quality investment vehicles. Investors were showing little or no interest in average quality minerals offerings that might otherwise have succeeded a decade ago.
- 3.46 The Queensland Mining Council referred to the high cost of assembling a prospectus to raise equity capital through IPOs and expressed the view

<sup>46</sup> Reed Resources Limited, Submission No. 98, p. 1495.

<sup>47</sup> Reed Resources Limited, Submission No. 98, p. 1495.

<sup>48</sup> Andrew Crooks, Submission No. 80, p. 1119.

<sup>49</sup> Lion Selection Group Limited, Submission No. 8, p. 40.

<sup>50</sup> Eduard Eshuys, Submission No. 32, p. 433.

<sup>51</sup> Andrew Crooks, *Submission No. 80*, p. 1123.

- that prospectus costs generated by the ASX listing rules were excessive for the amount of capital raised.<sup>52</sup>
- 3.47 The Committee recognises the dilemma raised by any move to simplify the IPO procedures whilst still ensuring that the public is reasonably protected from risks associated with a speculative float. It also recognises that the cost of capital raising could become a deterrent to raising any capital in small tranches, thereby selectively militating against the juniors.
- 3.48 The Committee concludes that the prospectus cost issue required immediate attention and was of the view that the industry peak bodies and the Australian Stock Exchange should get together and jointly design a lower cost process. The committee argues that any simpler process could be the *quid pro quo* to match a commitment by junior companies to raising the standards of portfolio asset descriptive data and providing exploration risk assessments.
- 3.49 It is the Committee's view that exploration companies now going to the market for equity finance need to pay closer attention to the quality of their investment portfolios on offer. Rigour needs to be shown in the assembly of the tenement portfolio, technical expertise, exploration concepts and methodology. Greater levels of transparency in exploration budgeting need to be adopted. In short, companies would need to offer a more attractive investment product to the market, showing clearly how risk is managed and where sound exploration strategies were in place.

# **Petroleum Exploration Sector**

- 3.50 The Committee received little specific evidence on the difficulties faced by petroleum exploration companies in raising capital. As in the minerals sector, large petroleum majors tend to source exploration capital internally.
- 3.51 The Australian petroleum exploration and production sector even more so than the minerals sector is part of a wider globalised industry. As such, the sector competes with other countries for petroleum exploration budget allocations by the majors. The critical issue affecting exploration is the attractiveness of Australia as an investment destination rather than whether the funds can be raised here or not.

3.52 As in the minerals sector, it is the lower profile junior petroleum exploration companies with no income stream which experience difficulty in raising capital on equity markets. However, in this case, the evidence suggests that this is primarily because large institutional investors favour the majors.<sup>53</sup>

## **Capital Raising Assistance: Minerals and Petroleum Sectors**

- 3.53 The Committee is concerned that juniors in both the minerals and petroleum sectors are finding it difficult to raise capital, particularly as these are the companies that are driving greenfields exploration. Policies aimed at helping juniors in the minerals sector especially, to raise capital are warranted.
- 3.54 The Committee is also of the view that companies, through their peak bodies, the ASX and professional associations, should design risk assessment standards to underpin risk analyses inserted in IPO documentation. This approach would aim to build the confidence of potential investors in the credibility of resources IPOs.

#### **Recommendation 1**

3.55 The Minister for Industry, Tourism and Resources facilitate meetings between appropriate industry representative bodies and the Australian Stock Exchange to develop quality control and risk assessment guidelines to assist minerals and petroleum exploration companies to assemble high quality Initial Public Offerings that can achieve market acceptance and support.

# Impact of the Tax Structure on Exploration

3.56 One factor claimed to affect capital raising by majors in both the minerals and petroleum sectors is the international lack of competitiveness of Australia's taxation environment.<sup>54</sup> Given that profit margins are often

<sup>53</sup> Draper, J., 2003, APPEA says oil self-sufficiency a myth, *Queensland Government Mining Journal*, June 2003, Vol 103, No. 1211, pp 40-1.

Cotopaxi International Pty Ltd, *Submission No. 34*, p. 445; Australian Petroleum Production and Exploration Association Ltd, *Submission No. 39*, pp 505-6; ExxonMobil Australia Pty Ltd, *Submission No. 18*, p. 137; BHP Billiton Petroleum Pty Ltd, *Submission No. 57*, p. 743.

- slim in both sectors, taxation imposts can significantly affect the project decisions of majors and their subsequent allocation of exploration funds. <sup>55</sup>
- 3.57 The company tax system makes it difficult for juniors in both the minerals and petroleum sectors to attract investment capital.<sup>56</sup> Junior exploration companies generate wealth (shareholder returns) by increasing asset values (tenements) rather than generating income streams. The tenements increase in value because the companies, hopefully, find deposits or accumulations on the tenements or at least increase their prospectivity.
- 3.58 However, without a taxable income, taxation asymmetry is created. The junior company will have no opportunity to deduct exploration and other expenses immediately, or perhaps ever.<sup>57</sup> In turn, this reduces the after tax net present value of projects which can lead to lower share prices. It can also discourage juniors from undertaking those exploration projects which might have had a positive net present value if only immediate deductions for exploration expenses had been allowed.
- 3.59 These problems do not affect large companies that have a taxable income stream. In this regard it is financially easier for large companies to conduct exploration, all else being equal, than it is for juniors to do so. It also means that exploration work that only juniors might consider worthwhile, is less likely to be undertaken.
- 3.60 Removal of this impediment to exploration by juniors requires a taxation structure that enables junior companies to obtain the full benefit of immediate deductibility of exploration and other exploration-related expenses.<sup>58</sup> This, in turn, should make junior exploration companies more attractive to the investment market and, thus allow easier access to capital (primarily through IPOs).
- 3.61 The present situation was described by APPEA as a highly distortionary disincentive to risk-taking.<sup>59</sup> A number of proposed solutions are discussed below.

<sup>55</sup> BHP Billiton Petroleum Pty Ltd, *Submission No. 57*, p. 743.

<sup>56</sup> Australian Petroleum Production and Exploration Association Ltd, Submission No. 39, pp 519-20.

<sup>57</sup> Income Tax Assessment Act 1997, s. 40-730.

Abareconomics, *Tax incentive Options for Junior Exploration Companies, abare, eReport 03.4, March 2003*, p. 36.

<sup>59</sup> Australian Petroleum Production and Exploration Association Ltd, Submission No. 39, p. 516.

## Flow-Through Share Schemes

- 3.62 There was widespread support in submissions and statements by witnesses for the introduction of a flow-through share scheme to assist junior exploration companies in both the minerals and petroleum sectors to raise exploration capital.<sup>60</sup>
- 3.63 Flow-through shares are an alternative to ordinary shares as a means of raising external capital to finance exploration. The major difference is that under a flow-through share arrangement, the exploration company passes the tax deductions that it can't realise itself through to its investors where they can be realised immediately.<sup>61</sup> The best known example, known as the "Canadian Model" because of its use in Canada to stimulate investment in exploration provides, in essence, that:
  - the company gives up the tax deduction that it would normally receive for qualifying exploration expenses;
  - the investor receives the tax deduction; and
  - the investor pays capital gains tax on the full value received on sale of the flow through shares (rather than just the actual capital gains).<sup>62</sup>
- 3.64 In other respects, a flow-through share is the same as an ordinary share. Under the Canadian scheme, any company engaged in exploration in Canada, not just juniors, may employ flow-through shares. In addition, the Canadian scheme only applies to defined qualifying exploration expenses and does not extend to wider exploration-related business expenses.
- 3.65 A flow-through share scheme for the exploration industry in Australia would provide broadly the same result as the existing Division 10B and 10BA tax concessions for the film industry. Under these concessions, deductions are granted to investors on the basis that they are conducting the business activity. Only exploration expenditure on Australian projects would qualify for flow-through benefits.
- 60 City of Kalgoorlie-Boulder, Submission No. 47, p. 571; Queensland Mining Council, Submission No. 60, p. 794; Newmont Australia, Submission No. 71, p. 974; Chamber of Minerals and Energy of Western Australia, Submission No. 78, p. 1079; Deloitte Touche Tohmatsu, Submission No. 12, pp 83-4; Australian Petroleum Production and Exploration Association Ltd, Submission No. 96, pp 1491-2.
- 61 Abareconomics, *Tax incentive Options for Junior Exploration Companies*, p. 41; Association Of Mining And Exploration Companies Inc, *The Importance of Implementing a System of 'Flow Through' Shares as a Mineral Exploration Incentive*, p. 9.
- 62 Abareconomics, Tax incentive Options for Junior Exploration Companies, p. 41.

- 3.66 Some witnesses expressed reservations about flow-through schemes. Rio Tinto Exploration believed that "it is highly debateable whether such schemes actually promote effective exploration" as distinct from speculation. 63 Other witnesses observed that the regulatory aspects of a flow through share scheme would need to be tight, to prevent any repeat of the misuse of the scheme that had occurred in Canada.
- 3.67 However, Deloitte Touche Tohmatsu sees that a primary benefit of a flow-through scheme is that it provides an incentive for majors (as distinct from speculators) to invest in exploration through subscribing to share issues by juniors. <sup>64</sup>
- 3.68 AMEC put forward the view that the Commonwealth introduce a flow-through share mechanism on a five year trial basis to see if such a scheme is cost-effective and ultimately leads to greater investment activity in junior exploration companies.<sup>65</sup>

#### **Tradeable Tax Credits**

- 3.69 The Committee recognised that tradeable tax credits and tax rebates are alternative arrangements that redress the tax asymmetry that juniors experience.
- 3.70 The Minerals Council of Australia submitted that a system of trade in tax credits would directly address this market failure. Juniors would be able to sell "tax credits" to other companies with sufficient income tax liability to utilize those deductions. This method would permit immediate realisation of the tax benefits of exploration outlays.<sup>66</sup>

# **Enhanced Tax Write-offs for Greenfields Exploration**

3.71 The Minerals Council of Australia and The Chamber of Minerals and Energy of Western Australia urged that greenfields exploration be eligible for a 125 per cent tax deduction.<sup>67</sup> Similarly, Rio Tinto Exploration argued

<sup>63</sup> Rio Tinto Exploration, *Submission No. 46*, p. 563; Abareconomics, *Tax incentive Options for Junior Exploration Companies*, p. 48.

<sup>64</sup> Deloitte Touche Tohmatsu, Submission No. 12, p. 84.

<sup>65</sup> Association Of Mining And Exploration Companies Inc, *The Importance of Implementing a System of 'Flow Through' Shares as a Mineral Exploration Incentive*, p. 10.

<sup>66</sup> Minerals Council of Australia, *Submission No. 81*, p. 1192-3; Minerals Council of Australia, *Transcript, 3 March 2003*, p. 273.

<sup>67</sup> Minerals Council of Australia, Submission No. 81, p. 1194.

- that an "enhanced tax write-off" against income of eligible greenfields exploration would encourage greenfields exploration by the majors.<sup>68</sup>
- 3.72 The Chamber of Minerals and Energy of Western Australia and the Minerals Council of Australia both argued that companies, by exploring, are enhancing geological information and making further exploration by other companies easier ("positive externalities"). This benefit is not recognised by the exploring company (as they do not capture the benefit) and thus some additional tax credit should be provided to overcome this market failure by ensuring that exploration occurs at optimal levels. <sup>69</sup>
- 3.73 In this regard, the Committee acknowledges that companies in general can deduct research and development expenditures at a concessional rate of 125 per cent. The argument is that exploration is the equivalent of research and development for the mining industry and, therefore, should be treated in a similar manner.
- 3.74 There is a case for a greater tax deduction rate for exploration activity. However, a disadvantage of this proposal is that it will only be effective for those companies engaging in exploration that generates income something, as already noted, that juniors often do not.

# **Subsidies for Greenfields Drilling**

- 3.75 Another suggestion was that there be subsidies or a tax rebate for eligible greenfields drilling. Drilling is the definitive way in which deposits or accumulations are confirmed. Deep drilling is expensive. If it were cheaper, there could be more testing. The catch is to devise a scheme that ensures that cheaper drilling does equate to less drilling and also to discourage frivolous drilling simply to obtain a subsidy.
- 3.76 The Australian Geoscience Council recommended that there be a subsidy rebate for the total costs of the first hole in each greenfields minerals drilling program for holes deeper than 300m. The subsidy would be capped \$20,000 being the limit suggested by the Council.<sup>71</sup>
- 3.77 Such a scheme could be administered through the tax system or through state agencies.

<sup>68</sup> Rio Tinto Exploration, Submission No. 46, p. 563.

<sup>69</sup> The Chamber of Minerals and Energy of Western Australia Inc., Submission No. 78, p. 1078.

<sup>70</sup> Dale Sims, Submission No. 58, p. 754.

<sup>71</sup> Australian Geoscience Council, Submission No. 49, p. 603.

#### Taxation Structure for the Minerals Sector: An Assessment

- 3.78 The Committee is keen to identify impediments to exploration and suggest and ways to ameliorate them. This includes identifying impediments caused by the taxation regime. However, the Committee believes that it should take a national approach when promoting taxation benefits for a particular industry. This approach will certainly be adopted by the Australian Taxation Office. For example, taxation changes to make exploration activity more attractive to speculative capital could simply draw the capital from other sectors, such as the tourism or biotechnology industries. The nation may or may not benefit, and it is beyond the Committee's capacity to make such assessments.
- 3.79 Furthermore, perceived taxation benefits should not drive what is otherwise fundamentally unviable exploration activity. "Any tax policy should provide an incentive for, and reward, success... rather than subsidise failure." The Committee seeks to promote taxation changes that will assist high risk, but geologically sound exploration.
- 3.80 Despite these caveats, there is good argument that the introduction of a flow-through share scheme will stimulate greenfields exploration.
- 3.81 The Committee is keen to encourage juniors, in the minerals sector in particular, to enter exploration joint ventures with majors. A flow-through share scheme should not only help juniors raise capital, but also provide an incentive for majors to boost their indirect interest in greenfields exploration by acquiring equity in junior public exploration companies.
- 3.82 The flexibility introduced by this type of inter-company relationship could permit some of the disadvantages of more traditional joint venture partnerships between majors and juniors to be addressed more effectively. For example, in the event of project down-scaling the economic parameters of a joint-venture exploration project may be accommodated by both major and junior partners, through the flexibility that a flow-through scheme offers in terms of equity and tax effectiveness.
- 3.83 While a flow-through shares scheme would be of most benefit to juniors (as recipients) and majors (as investors) in the minerals sector, it could be of equal attractiveness to those in the petroleum sector. The attractiveness of a flow-through share scheme to the petroleum industry is discussed below.

#### **Recommendation 2**

- 3.84 The Minister for Industry, Tourism and Resources in conjunction with the Treasurer investigate the introduction of a Flow-Through Share Scheme for companies conducting eligible minerals and petroleum exploration activities in Australia.
- 3.85 Such a scheme could rely on the definitions of exploration contained in the *Income Tax Assessment Act 1997* and greenfields exploration presented in Chapter 1 of this report. There is no need to limit a scheme to a particular size of company.<sup>73</sup> By its very nature, a flow-through share scheme will appeal to juniors without an income stream and less so to large companies funding exploration through income sources.
- 3.86 A flow-through share scheme should provide sufficient taxation relief to assist scientifically sound greenfields exploration without there being a need to also provide a potentially distortionary 125 percent deduction for the associated expenses. While attractive to the large income producing companies, a 125 percent deduction scheme will be of little direct benefit to juniors without an income stream. Further, the Committee is not convinced that greenfields exploration activity is the equivalent of research and development and should therefore qualify for a 125 percent expenditure deduction. Such a deduction may be justifiable in the future, but not on the basis that exploration is research and development and only after the impact of a flow-through scheme on exploration activity and the taxation base had been established.

# **Taxation Regime for Petroleum Exploration**

- 3.87 Submissions and evidence repeatedly asserted that taxation was one of the primary factors that affected the economic quality of petroleum development and production opportunities in different jurisdictions around the world.
- 3.88 Woodside Energy rated Australia as unattractive for high risk, deepwater or other frontier exploration and development of marginal fields (regardless of water depth) because of the current fiscal regime. HPP Billiton Petroleum concurred by stating that in the global context, Australia is not an attractive exploration investment location especially for

<sup>73</sup> Income Tax Assessment Act 1997, s. 40-730.

<sup>74</sup> Woodside Energy Ltd, Submission No. 44, p. 535.

frontier and deepwater exploration because the fiscal rewards are not commensurate with the high cost and risk. 75 APPEA noted that the Australian taxation framework accounted for 43 per cent of the total operational costs facing the petroleum industry and that because many prospective petroleum projects can be marginally economic, the impact of taxation imposts can have an important bearing on project decisions and the subsequent allocation of funds. 76

- 3.89 The Commonwealth Bank stated that Australia is not attractive for international petroleum investment with a fiscal rank of 90 out of 162 fiscal regimes offered internationally.<sup>77</sup>
- 3.90 Many petroleum production projects operate on slim margins.

  Accordingly, taxation imposts can affect whether petroleum majors will allocate exploration funds to Australia or to other countries. <sup>78</sup>.
- 3.91 However, even with the most globally competitive tax regime, companies will not explore a region if they think it has poor prospectivity.<sup>79</sup>

  Compelling strategies to enhance Australia's minerals and hydrocarbons prospectivity are presented in the following chapters of this report.

#### Resource Rent Tax: PRRT

- 3.92 The petroleum industry is subject to the Petroleum Resource Rent Tax (PRRT), levied under the provisions of the *Petroleum Resource Rent Tax Assessment Act* 1987 on offshore oil production. This is the Federal Government's primary petroleum taxation mechanism. The tax is assessed at 40 per cent of net amounts received from the sale of all petroleum or marketable petroleum products.
- 3.93 Deductible items include capital or operating costs that directly relate to the offshore petroleum project, including expenditure on exploration. 80
- 3.94 Major petroleum exploration companies feel that Australia would be a more attractive investment destination if there were a per project barrel of

<sup>75</sup> BHPBilliton, Submission No. 57, p. 738.

<sup>76</sup> Australian Petroleum Production and Exploration Association Ltd, *Submission No. 39*, pp 505-6.

<sup>77</sup> Commonwealth Bank of Australia, Submission No. 55, p. 693.

<sup>78</sup> ExxonMobil Australia Pty Ltd, *Submission No. 18*, p. 137; APPEA, *Submission No. 39*, pp 505-6; BHP Billiton Petroleum Pty Ltd, *Submission No. 57*, p. 743.

<sup>79</sup> Western Australian Government, Submission No. 84, p. 1355.

ExxonMobil Australia Pty Ltd, *Submission No. 18*, p. 137; Australian Petroleum Production and Exploration Association Ltd, *Submission No. 39*, p. 508.

- oil equivalent (BOE) production exemption from PRRT assessment for frontier and deepwater exploration. They also feel that investment would be encouraged by lowering or abolishing the PRRT tax rate for frontier and deepwater exploration<sup>81</sup>.
- 3.95 However, the Department of Industry, Tourism and Resources (DITR) argued that there is no need to change the PRRT regime to encourage deepwater exploration. Empirical evidence produced by DITR shows that the companies that have been exploring frontier and deepwater areas have been doing so for the last 15 years, and deepwater wells have increased in number in the last decade. DITR believes there is no need to change PRRT while the industry is exploring in these areas<sup>82</sup>.
- 3.96 DITR also argued that the PRRT should not be changed in order to allow incentives to be granted to petroleum companies in special cases. Although these measures would encourage the development of marginal areas, they would also undermine the integrity of the taxation framework. The current PRRT is transparent, allowing petroleum companies to accurately predict the tax impact of their projects. This reduces Australia's sovereign risk, making it a more attractive investment destination<sup>83</sup>.

# Specific Concerns with the PRRT

3.97 While the Committee recognises the need to maintain the integrity of the tax base, it is conscious that Australia also needs to have a globally competitive tax regime. APPEA has drawn attention to two elements of the PRRT in particular which it believes inhibit petroleum production and thus exploration. One issue of concern is that the carry forward rate for undeducted general project related expenditures on new projects has been reduced from the long term bond rate (LTBR) plus 15 percentage points down to the LTBR plus 5 percentage points. The impact, according to APPEA, is that there is a possibility of a tax liability being incurred before an economic return has been generated. The sector believes the rate should be increased to at least the long term bond rate plus 10 percentage points to more adequately account for the risks in the petroleum exploration and production sector. 84

ExxonMobil Australia Pty Ltd, *Submission No. 18*, p. 137; Australian Petroleum Production and Exploration Association Ltd, *Submission No. 39*, p. 508; Woodside Energy Ltd, *Submission No. 44*, pp 545-6; BHP Billiton Petroleum Pty Ltd, *Submission No. 57*, p. 749.

<sup>82</sup> Department of Tourism, Industry and Resources, Transcript, 20 March 2003, pp 12-3.

<sup>83</sup> Department of Tourism, Industry and Resources, Transcript, 20 March 2003, p. 15.

<sup>84</sup> Australian Petroleum Production and Exploration Association, Submission No. 39, pp 509-11.

- 3.98 The other issue of concern about the PRRT is that deductions for prior exploration expenditure are currently compounded forward at LTBR plus 15 percentage points if the expenditure has been incurred within five years of the date on which information is provided to obtain a production licence. Exploration expenditure incurred more than five years earlier than this date is compounded forward at the significantly lower Gross Domestic Product factor rate. Some petroleum exploration projects, particularly in deepwater, have long lead times, and cannot be completed within five years. The five year time limit applied by the PRRT discourages investment in these projects. The impact is a "dramatic drop in the value of the eligible exploration deductions for companies without a production licence". <sup>85</sup> This, in turn can discourage investments in deepwater areas, particularly if explorers do not have an existing production licence.
- 3.99 The Committee's inquiry focuses on exploration rather than production. However, the Committee acknowledges that exploration will not occur if the existing tax regime makes offshore petroleum production in Australia internationally uncompetitive. Accordingly, the Committee makes the following recommendation to account for petroleum exploration risks and to encourage deep-water exploration.

ExxonMobil Australia Pty Ltd, *Submission No. 18*, p. 137; Australian Petroleum Production and Exploration Association Ltd, *Submission No. 39*, pp 508-9, 513; Woodside Energy Ltd, *Submission No. 44*, pp 545-6; BHP Billiton Petroleum Pty Ltd, *Submission No. 57*, p. 750.

## **Recommendation 3**

- 3.100 The Petroleum Resource Rent Tax be reviewed to investigate the options of:
  - Raising the carry forward rate for un-deducted general project related expenditures from the long term bond rate plus five percentage points to a minimum of the long term bond rate plus ten percentage points;
  - Allowing undeducted exploration expenditure incurred more than five years prior to the provision of a production licence to be compounded forward at the Long Term Bond Rate plus 15 percentage points for the first five years and then, for the subsequent years, compounded forward at the Long Term Bond Rate; and
  - Reducing the PRRT rate for petroleum production from newly discovered accumulations in waters of greater than 400 meters depth, and according to a production plan deemed by the Minister for Industry, Tourism and Resources to be in the national interest.
- 3.101 However, there should be a concomitant obligation for greater accountability placed on exploration companies and the Committee recommends accordingly.

## **Recommendation 4**

- 3.102 The administration of retention leases be reviewed to require:
  - Work program technical details (excluding financial information), relating to retention leases issued to petroleum exploration companies under the *Petroleum (Submerged Lands) Act 1967*, be made public;
  - Holders of retention leases under the *Petroleum (Submerged Lands) Act 1967* applying for re-issue of those retention leases, show cause why those retention leases should not be made contestable after expiry of the first five years of tenure, and any subsequent five years of tenure.

## **Resource Taxes: Royalties**

- 3.103 The Federal Government applies royalties to the North West Shelf project area, an offshore area which for historic reasons is not subject to PRRT. The states apply royalties on the production of onshore petroleum under their jurisdictions. Royalties are generally assessed as a percentage of the wellhead value of oil and gas production. Deductions include part of the cost of production infrastructure, processing and transportation, but not costs associated with exploration<sup>86</sup>.
- 3.104 The petroleum sector accepts that the existing royalty and excise provisions are not a major impediment to onshore exploration and development activity. However, APPEA reminded governments of the impact that these imposts can have on the economics of marginal projects<sup>87</sup>.

## **Company Tax**

- 3.105 As in the minerals sector, junior exploration companies and companies that are yet to begin production with limited or no income streams are not in a position to take advantage of tax laws that presently allow for the immediate deductability of exploration costs. Petroleum juniors advise that this is making them less attractive to capital markets and diminishing their ability to raise funds. 88
- 3.106 APPEA noted that in the past there had been a number of schemes that allowed for the deductibility of petroleum exploration expenditures to be passed to shareholders in effect, flow-through share schemes.<sup>89</sup> APPEA recommends a flow through share scheme, be introduced which could:

realistically be expected to produce a significant boost to the overall petroleum exploration effort in Australia....<sup>90</sup>

3.107 The Committee has already advanced arguments, primarily in the context of the minerals sector, for a flow-through share scheme aimed at attracting additional investment in greenfields exploration. The arguments apply

Australian Petroleum Production and Exploration Association, Submission No. 39, p. 514; Department of Tourism, Industry and Resources, *Transcript, 20 March 2003*, p. 10.

<sup>87</sup> Australian Petroleum Production and Exploration Association, Submission No. 39, p. 515.

Australian Petroleum Production and Exploration Association, *Submission No. 96*, p. 1491; Agip Australia, Submission No. 28, pp 242-3; Strike Oil NL, *Submission No. 42*, p. 529.

<sup>89</sup> Australian Petroleum Production and Exploration Association, Submission No. 96, p. 1491.

<sup>90</sup> Australian Petroleum Production and Exploration Association, Submission No. 96, p. 1492.

- equally for the petroleum sector and, accordingly, Recommendation 2 has been phrased to apply to both sectors.
- 3.108 These recommendations are particularly designed to stimulate greenfields exploration by juniors, but should also provide benefits for larger companies engaging in exploration in both the minerals and petroleum sectors.

# **Possible Petroleum Liquids Bounty**

- 3.109 The Committee has agreed that a strong junior sector is also vital for petroleum exploration in Australia, and that action to encourage a more operationally active junior sector would benefit petroleum exploration, particularly onshore exploration, in Australia.
- 3.110 The Committee noted the recent successes by Beach Petroleum and Stuart Petroleum in moving from junior explorers to producers in the Cooper Basin. This followed the freeing up of the South Australian Cooper Basin area for new exploration tenement applications by parties other than the Cooper Basin partners (the relinquishing parties). The Committee thought this model of junior explorers exploring small proximal closures leading to discovery and extraction of small petroleum liquids accumulations warranted support.
- 3.111 The introduction of liquids identification bounties to companies proving incremental additions to the Australian petroleum liquids EDR could make it worthwhile for petroleum exploration companies to explore small closures and the margins of producing basins by proximal infrastructure drilling, for small but valuable crude oil accumulations. The Committee makes the following recommendation for consideration by the Government and industry.

#### **Recommendation 5**

3.112 The Minister for Industry, Tourism and Resources and appropriate petroleum production and exploration peak bodies, review the feasibility of a "liquids identification" bounty scheme for junior exploration companies to encourage them to explore the margins of onshore production basins for small accumulations of petroleum liquids.