World Exploration Trends

A Special Report from Metals Economics Group
for the PDAC 2006 International Convention

MEG
Metals Economics Group

Corporate Exploration Strategies

The PDAC was pleased to work with Metals Economics Group to make this special report on World Exploration Trends available to our members and PDAC Convention 2006 delegates. The PDAC uses Metals Economics Group's Corporate Exploration Strategies (CES) as an essential tool for obtaining information on global exploration trends. CES is acknowledged as the primary source of information on exploration and mining statistics worldwide.
Tony Andrews, *Executive Director,* PDAC

Briefly, Corporate Exploration Strategies examines the nonferrous exploration activities of all mining companies worldwide. Volume I provides a ten-year summary of trends in exploration spending and an industry-wide analysis of allocations by location, target, stage of development, and more. Volume II reports in detail each company's exploration budget and its breakdown by country, target, and stage of development. Companies with significant exploration budgets are given special attention—each company's current exploration program, strategy, and most advanced exploration projects are profiled in detail. The study also includes an appendix of companies that do not have exploration budgets but which do have significant exploration projects for which they are seeking financing or joint ventures.

Subscribers to Corporate Exploration Strategies include most major mining companies, national and provincial governments, mining service and equipment companies, and financial institutions. Mining companies typically use Corporate Exploration Strategies for benchmarking their exploration programs, developing competitor intelligence, strategic planning, and corporate and board presentations. Governments and mining industry associations use the CES in a similar way—benchmarking country exploration budgets and gathering intelligence on national competitors for exploration spending—as well as analyzing trends to develop mineral policy. Mining service and equipment companies perform market and strategic-trend analysis as well, but also use the CES to shift resources to emerging markets, target specific clients, and develop competitor intelligence. Financial groups commonly use the CES for investment decision support and mining-market and strategic-trend analysis.

Overview

World Exploration Budgets 2005

Worldwide exploration budgets reach $5.1 billion in 2005—just shy of the 1997 peak

According to Metals Economics Group's sixteenth annual edition of Corporate Exploration Strategies, worldwide allocations for commercially-oriented nonferrous exploration rose for three years, rebounding to a level just shy of the high-water mark set during the last exploration boom. The $5.1 billion 2005 total is up by 34% from 2004 and 168% since the bottom of the cycle in 2002. *(All figures in this report are in U.S. dollars.)*

Worldwide nonferrous exploration budgets steadily increased through the early 1990s to a crest of $5.2 billion in 1997 (see Figure 1), before falling for five straight years to a 12-year low of $1.9 billion in 2002—an overall decline of more than 63%. Since 2002, our estimated total rose for three years, rebounding to a level just shy of the high-water mark set during the last exploration boom. Metals Economics Group's 2005 analysis of 1,431 companies' exploration budgets (using a $100,000 cutoff) totals almost $4.9 billion, which we estimate covers more than 95% of worldwide commercially-oriented nonferrous expenditures. When we also include estimates for budgets that we could not obtain, our estimate of total 2005 exploration expenditures reaches $5.1 billion—up 34% ($1.3 billion) from 2004 and a rise of 168% ($3.2 billion) since 2002. *(All historic exploration figures represent dollars of the day and have not been inflation-adjusted.)*

Figure 1: Estimated Total Worldwide Nonferrous Exploration Budgets vs Relative Metals Prices, 1996-2005

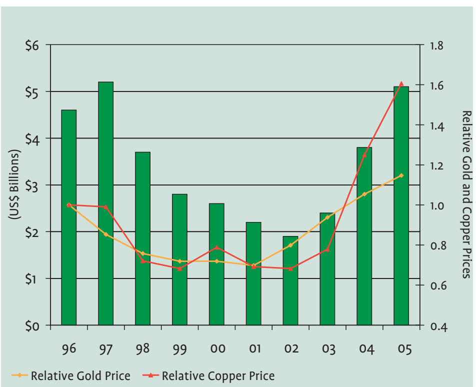
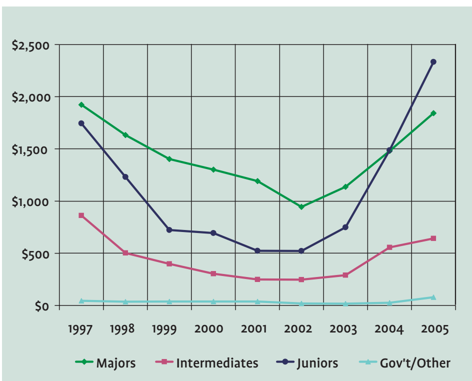


Figure 2: Worldwide Exploration Budgets by Company Type, 1997-2005

(US$ millions)



Following the 1997 peak of exploration spending, substantial cutbacks by the majors, the negative impact of industry consolidation, and a loss of funding for most junior companies contributed to five straight years of declining exploration budgets to the 12-year low in 2002. The initial increase in worldwide exploration from the bottom of the cycle can be attributed to a combination of increased spending by the majors as they recognized the dearth of new projects moving up the pipeline, significantly reduced industry consolidation from peak levels in 2000 and 2001, and increased spending by the junior sector on the back of higher gold prices and rising investor interest. As the gold price continued to rise and prices for other commodities began to reach their current long-term, and in some cases, record highs, yearly budget increases by the majors (struggling to replace mined reserves) and meteoric increases by the juniors pushed the estimated worldwide exploration total to $5.1 billion in 2005—just shy of the 1997 peak.

Junior explorers now account for almost half of worldwide exploration

Junior-company exploration budgets included in our study rose almost 57% to $2.3 billion in 2005, accounting for more than 63% of the overall $1.3 billion increase in exploration allocations by all surveyed companies—the second consecutive year that the juniors accounted for more than half of the overall increase. Figure 2 compares the exploration budget totals for major, intermediate, and junior companies, and for commercially-oriented government-controlled entities included in our study from 1997 to 2005.

At the 1997 peak of exploration spending, cashed-up juniors accounted for less than 40% of worldwide exploration. The sharp decline in metals prices that followed and persisted through 2001, exacerbated in the early years by industry scandal and the popularity of investing in the dot-com sector, impacted the juniors' ability to secure the financing necessary to fund exploration. This resulted in a steeper decline in exploration allocations by

Table 1: Effect of Consolidation on Exploration Budgets in the Year Following an Acquisition, 1997-2005

Year of Acquisition	Number of Companies Acquired with Substantial Budgets	Acquired Companies' Total Budgets in Acquisition Year (US$ mil)	Buyers' Total Budgets in Acquisition Year (US$ mil)	Combined Budgets of all Companies in Acquisition Year (US$ mil)	Merged Companies' Total Budgets in Year Following Acquisition (US$ mil)	Decline in Budgets by Merged Companies (US$ mil)
2005	14	$251.2	$548.4	$799.6	N/A	N/A
2004	4	$50.0	$51.8	$101.8	$51.0	-$50.8
2003	3	$33.4	$66.5	$99.9	$86.9	-$13.0
2002	7	$44.5	$74.7	$119.2	$113.0	-$6.2
2001	9	$171.4	$249.7	$421.1	$281.6	-$139.5
2000	9	$100.2	$448.1	$548.3	$406.9	-$141.4
1999	7	$78.1	$341.3	$419.4	$371.5	-$47.9
1998	9	$115.8	$298.1	$413.9	$346.8	-$67.1
1997	7	$100.4	$293.8	$394.2	$304.8	-$89.4
Totals	**69**	**$945.0**	**$2,372.4**	**$3,317.4**	**$1,962.5**	**-$555.3**

Data sources: MEG's Corporate Exploration Strategies and Gold and Base Metals Acquisitions Services

the juniors than by the other industry groups during the period, as the juniors' share of worldwide exploration spending declined to only about 25% in 2001.

The revival of junior exploration spending began in mid-2002 (although the increase in exploration allocations by the group did not manifest until 2003, since the majority of budgets are set at the beginning of the year), as a recovering gold price began to reawaken many dormant junior companies. As prices for most commodities have strengthened to long-term highs, the improvement in mining industry investment has allowed most juniors to raise the funds necessary to restart exploration, and encouraged a flurry of IPO activity on the primary stock exchanges. Since the bottom of the cycle in 2002, junior exploration spending increased a remarkable 350%, accounting for almost 60% of the overall $3.2 billion rise in exploration allocations by all surveyed companies from 2002 to 2005. As Figure 2 shows, the substantial increase in junior exploration budgets relative to the other groups since the bottom of the cycle resulted in the juniors' combined budgets surpassing that of the majors for the first time in 2004, albeit by only a little more than $7 million. The rise in junior budgets in 2005 continued to outstrip increases by other industry groups—the juniors account for nearly half of 2005's worldwide exploration total by all surveyed companies, the highest proportion allocated by the group since we began this series of studies.

Acquisitions have had less of a negative effect on exploration in recent years...

When we look at the effects of industry consolidation on exploration spending over the past few years, we see that large portions of the acquired companies' budgets effectively disappeared in the years following an acquisition, as the surviving companies' budgets either remained the same as before the acquisition or were reduced further, despite incorporating an expanded exploration portfolio. Table 1 lists the number of substantial companies acquired each year (generally those with an acquisition price of more than $50 million) that had substantive exploration budgets in the year they were acquired, and shows the cumulative effect on their budgets in the year following the acquisition. (For the purpose of this discussion, we have treated any mergers that occurred during this period as acquisitions.) It is important to note that, while cost savings through overhead synergies certainly contribute to the decline in a surviving company's exploration budget compared with the combined budgets of the pre-merged companies, much of the declines over the past few years can clearly be attributed to actual cuts to exploration programs.

From 1997 through 2004, the industry saw the demise of 55 significant mining and exploration companies, effectively erasing a cumulative $555 million from worldwide exploration spending during this period. While major company consolidations have had a negative effect on subsequent exploration in each of the years since 1997, industry consolidation at the peak of acquisition activity in 2000 and 2001 cumulatively cut about $280 million in exploration budgets, accounting for more than half of the overall decline due to acquisitions over this period. While the acquisitions totals in 2000 and 2001 were largely driven by consolidations among major companies, many of the companies acquired over the following three years were smaller and intermediate miners with less substantial budgets—not one of the 14 companies acquired from 2002 to 2004 had an exploration budget of more than $20 million, compared with four companies with budgets greater than $20 million in 2001 alone—and as a result, acquisitions have had less of a negative impact on exploration since the bottom of the exploration cycle in 2002.

...but in 2005, significant acquisitions rose to record levels

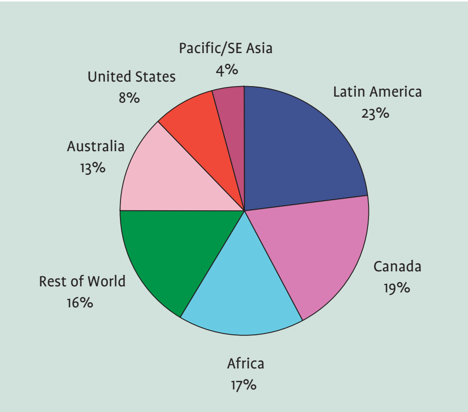
In 2005, however, significant gold and base metals acquisitions* drove the annual acquisitions total to a record of almost $42 billion, highlighted by BHP Billiton's acquisition of WMC Resources, Noranda's consolidation with 58.8%-owned Falconbridge, Inco's acquisition of the consolidated Falconbridge, and Barrick Gold's acquisition of Placer Dome, which together account for about $31 billion of the 2005 acquisitions total. Through 2005, we saw 14 significant acquisition agreements or offers (Inco's offer for the combined Falconbridge effectively moves Noranda's 2005 exploration budget from the buyers' budget column to the acquired companies' budget column) involving companies with combined 2005 budgets totaling more than $250 million—almost double the cumulative budgets of the 14 companies acquired over the preceding three years.

What will happen to the exploration departments and budgets of the 14 companies

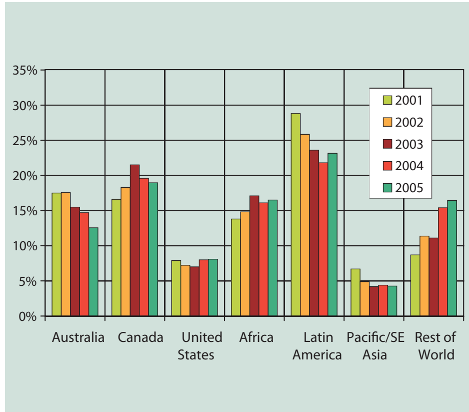
**Based on information from Metals Economics Group's Gold and Base Metals Acquisitions Services, and limited to gold and base metals (primarily copper, nickel, zinc, and silver) transactions announced each year valued at $25 million or more. Both company and project deals are included for each year.*

Figure 3: Worldwide Nonferrous Exploration Budgets by Region

Worldwide Exploration Spending by Region, 2005
(1,431 companies' budgets totaling $4.9 billion)



Worldwide Exploration Spending by Region, 2001- 2005
(as a percentage of worldwide exploration)



acquired in 2005 within the surviving companies' 2006 exploration efforts remains to be seen, but it is safe to assume that at least a portion of the acquired companies' budgets will disappear within the survivors' portfolios—BHP Billiton, Inco, and Barrick combined will have to increase their budgets by a total of $180 million in 2006 to effectively replace the exploration budgets of WMC Resources, Noranda/Falconbridge, and Placer Dome.

Latin America is still the leading location for spending

Figure 3 shows the regional distribution of the $4.9 billion in commercially-oriented nonferrous exploration allocations of the 1,431 companies included in our 2005 study, and a five-year comparison of the regional allocations as a percentage of each year's worldwide exploration total.

Exploration allocations by surveyed companies increased in each of our regional categories for the third consecutive year, with four regions' allocations increasing by more than $200 million in 2005: Latin America (up by $360 million), led by increased spending in Mexico and Peru; our rest-of-world category (up by $256 million), led by continued increased interest in Russia, China, and Mongolia; Africa (up by $237 million), with Angola, the Democratic Republic of Congo, and Gabon showing the largest gains; and Canada (up by $231 million).

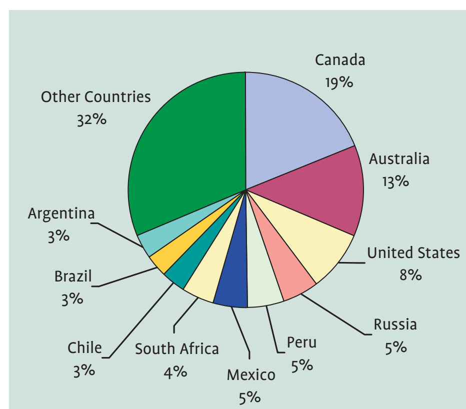
Latin America continued to be the most popular destination for exploration, increasing its lead for the second consecutive year over second-place Canada to $205 million, after Canada's exploration tax incentives helped close the gap to a margin of less than $50 million in 2003. Africa remained in third place by region, closely followed by our rest-of-world category, which includes Europe, the Former Soviet Union, Asia, and the Middle East. Despite a gradual slide to fifth place by region since 2001, Australia remained solidly in second place by country. The United States and the Pacific/Southeast Asia region remained in sixth and seventh place, respectively, positions they held since 2001.

Looking forward, social upheaval in Latin America and Southeast Asia could affect the regional picture of the industry's exploration efforts. Through the 1990s, expectations of the indigenous people in developing areas were relatively low and mining developments advanced almost unimpeded. But their children's expectations are higher, and the expectations of the NGOs that have been advising them have become more important. Also, the tendency of some governments in these regions to shift social responsibility to mining companies and thereby increase potential development costs is exacerbating the industry's caution towards investing in these countries. In addition, shifting tax and royalty regimes in South America and southern Africa, and the recent expiration of Canada's super flow-through tax incentive, may also dampen exploration growth in these regions in the near future.

Top ten countries show continued growth in Russia and Mexico

Figure 4 illustrates the distribution of 2005 exploration budgets for the top ten individual countries, which account for 69% of the overall budget total, slightly below the range seen in the previous five years. Allocations are recorded for 103 individual countries in 2005, compared with 99 in 2004. The traditional big three—Canada, Australia, and the United States—head the list, with Canada widening its ascendancy again in 2005, attracting over $300 million more in exploration allocations than Australia. Russia jumped from seventh to fourth place, moving Peru back to the fifth spot. Mexico moved ahead of South Africa and remained in sixth place, while Chile passed Brazil to take the eighth slot. Argentina, which was bumped from the list last year by Mongolia, has reclaimed tenth place. Also worth noting is the surge in the number of companies actively exploring in China, resulting in a substantial increase in allocations and giving it the eleventh-place ranking for the second consecutive year.

Figure 4: 2005 Exploration Budgets for the Top Ten Countries (top ten countries budgets total $3.4 billion; 69% of 2005 total budgets of $4.9 billion)

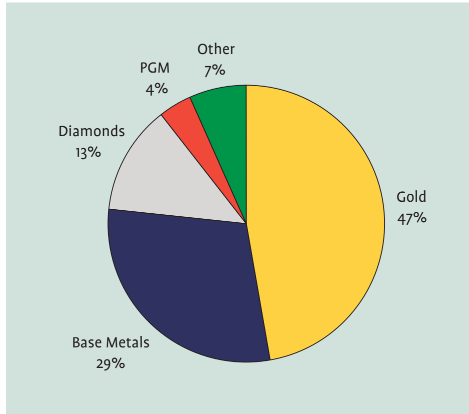


Base metals and diamond allocations reach new heights

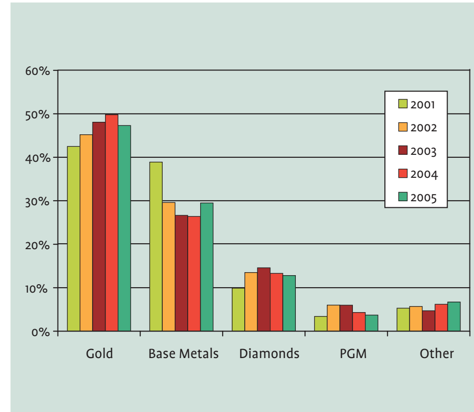
In 2005, exploration allocations by target show base metals and diamonds at record levels, gold continuing to rise but still well below the 1997 high, and platinum group metals recording the weakest growth. Figure 5 on the next page illustrates the distribution of exploration allocations by target for the companies included in our 2005 study, and a

Figure 5: Worldwide Nonferrous Exploration Budgets by Target

Worldwide Exploration Spending by Target, 2005
(1,431 companies' budgets totaling $4.9 billion)



Worldwide Exploration Spending by Target, 2001-2005
(as a percentage of worldwide exploration)



five-year comparison of the allocations to each target as a percentage of each year's worldwide exploration total. Gold has consistently attracted more exploration expenditure than any other metal, but dropped back below the 50% level in 2005, receiving less than half of the overall budget total for five of the last six years. Despite a three-fold increase in gold allocations since the bottom of the exploration cycle in 2002, the $2.3 billion allocated to gold in 2005 is still about 20% less than at the 1997 exploration peak, when gold attracted almost $3 billion and represented 65% of overall spending.

Base metals allocations increased significantly over the past three years, as copper, nickel, and zinc prices reached their highest levels in many years. Copper allocations, accounting for at least half of the base metals total for more than a decade, comprise 57% of the 2005 base metals total, surpassing the previous peak reached in 1997. Nickel exploration also surpassed its previous high-water mark, rising 65% year-on-year in 2005, while zinc allocations nearly doubled from 2004 to 2005. Despite the substantial rise in zinc exploration, however, the 2005 total remains well below the 1997 peak.

Diamond allocations rose for four consecutive years, increasing a further 33% in 2005. Since the early 1990s, when the discovery of diamonds in northern Canada sparked a diamond exploration boom, Canada has increasingly vied with Africa as the most popular destination for diamond exploration allocations—in the ten years from 1996 to 2005, diamond allocations for Africa totaled $1.23 billion compared with $1.09 billion for Canada. Exploration allocations for platinum group metals recorded the weakest growth for the second year, increasing by a relatively meager 16% in 2005, while budgets for other targets (primarily silver, molybdenum, cobalt, mineral sands, and industrial minerals) rose by 49%.

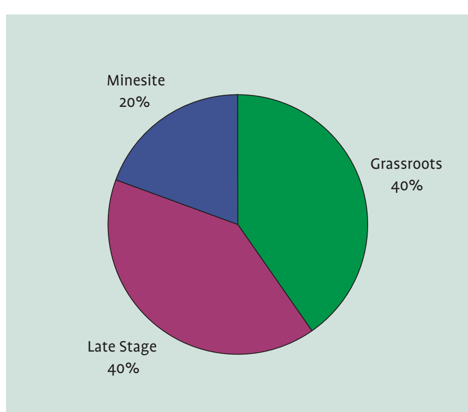
Late-stage allocations exceed grassroots exploration

Figure 6 illustrates the distribution of the $4.9 billion in exploration allocations by stage of development for the companies included in our 2005 study, and a five-year comparison of the allocations to each stage as a percentage of each year's worldwide exploration total. Late-stage exploration has become increasingly important in the current exploration cycle, as higher metals prices and other global factors are encouraging companies at all levels of the industry to focus on their later-stage projects—the junior explorers, to prove up reserves in order to hold the attention of investors and to attract the majors; aspiring and small producers, to secure development financing while the market is strong; and majors, to fast-track projects in their existing pipeline. In addition, several known dormant projects, previously determined as uneconomic at the bottom of the commodities price cycle, are now being reevaluated for development.

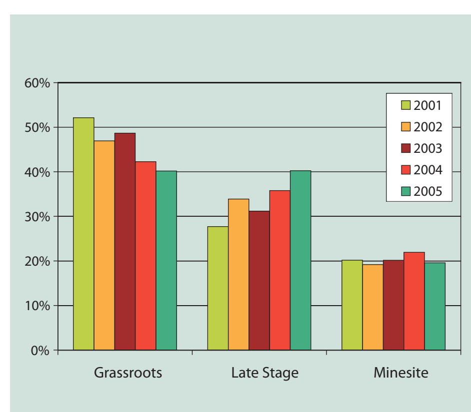
The above-average increases in late-stage budgets over the past two years have far outstripped the increases in grassroots budgets, which have traditionally attracted the largest percentage of worldwide exploration spending. As a result, total late-stage budgets exceeded total grassroots budgets (although by only $3 million) for the first time since we began our series of exploration studies.
We expect that companies will continue to focus on late-stage exploration work in 2006, with late-stage budgets increasing further over allocations for grassroots work. Eventually, companies will work through the pipeline of existing late-stage projects and evaluate whether they are feasible or not. That day is coming for a number of projects—particularly for those that previously proved uneconomic and are simply being reevaluated in light of the

Figure 6: Worldwide Nonferrous Exploration Budgets by Stage of Development

Worldwide Exploration Spending by Stage, 2005
(1,431 companies' budgets totaling $4.9 billion)



Worldwide Exploration Spending by Stage, 2001-2005
(as a percentage of worldwide exploration)



current improved market—and the pipeline of late-stage projects will gradually diminish. Late-stage work is generally considerably more expensive per project than early-stage or even minesite exploration; as companies deplete the existing pipeline of late-stage projects, that component of worldwide budgets will decline. Although those late-stage projects that prove marginal or uneconomic will obviously not disappear, many of them will likely be shelved once again in the near term.

Looking forward

The industry is currently experiencing boom times, as almost unprecedented demand has pushed prices for most mined commodities to long-term, and in a few cases, record highs. The widely-held view that the current metals price rally is not just a temporary recovery but a fundamental break from the long-term downward trend of the past few decades—commonly referred to as the "super-cycle"—is based almost entirely on the long-term growth projections for China. Many industry analysts believe that the industrialization of China, followed closely by India, will keep demand high for many years if not decades, and that it will take years for the industry to meet this increased demand due to the long lead time required to develop new mine supply. Others are of the view that the factors pushing production and development costs higher, not the pull of increased demand, will support commodities prices in the mid-to-long term, since higher costs necessitate higher prices in order to remain profitable. The main difference between these two views is that increased demand means higher margins for the producers, while increased costs do not. Whether continued high metals prices are the result of increased demand or the result of rising production costs (or more likely some combination of the two), the current rally appears to be sustainable for the near term. Much of the industry claims that "this time it's different" and that higher commodities prices are here to stay. Be that as it may, based on what is known, we expect that most metals prices will continue to see support at or near their current highs for the foreseeable future.

In addition, deep cuts to exploration spending by the industry from 1998 to 2002 have resulted in a decline in discovery rates in recent years, and the ensuing lack of new large-scale projects entering the pipeline will eventually put added pressure on global supply. Although the industry's existing pipeline includes a handful of substantial projects that are slated for development within the next three to five years, if demand continues to grow at current rates, reserves will quickly decline unless the industry finds new projects that meet the hurdle rates of the majors. Although it remains to be seen if the current recovery in exploration spending will produce such projects, the length of time required to take a project from discovery through to production ensures that any new discoveries will not benefit global supply for many years.

In the meantime, some companies are returning to acquisitions as a means of increasing their reserves and production; however, swapping existing assets does not create new reserves within the industry as a whole. A pure acquisition strategy presupposes successful exploration spending by other companies to create the pool of new assets to acquire; although the mining industry does not act as a group, the eventual discovery of the next generation of large-scale projects is essential for the long-term health of the industry.

Exploration will continue to rise in 2006

The continuation of the current junior-led recovery in exploration relies largely on the junior companies' ability to continue to raise capital. The juniors have raised substantial amounts of money over the past few years—at year-end 2005, many already had the coffers to at least partially fund their 2006 exploration programs—and high metals prices will help the juniors continue to attract investors for the short term. In addition, while some of the major producers are likely near capacity in terms of efficient exploration spending, and the group as a whole is unlikely to substantially increase their budgets over the next few years, a few major and intermediate companies do have room to, and likely will, expand their exploration programs. We expect that a continued increase in exploration spending by the junior sector, coupled with expanded programs by a handful of intermediate and major producers, will likely outweigh the expected negative effects of 2005's high level of acquisitions. As a result, we will see a modest gain in 2006 worldwide exploration spending—establishing 2006 as the new peak in the exploration cycle.

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For more information on how we can be of service to you, please visit our web site at www.metalseconomics.com or call 902-429-2880.

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Metals Economics Group's clients include most major global mining companies, smaller mining companies focused on growth, financial firms, service and equipment providers, and governments. Clients use our services to

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- Identify potential buyers
- Generate client lists
- Maintain watching briefs
- Perform "what if" scenarios
- Produce in-depth, detailed analysis

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The MineSearch database, available to subscribers on the Internet, compiles available information on more than 9,000 worldwide precious and base metals, diamond, and iron ore developing projects and mines, with 25 years of historical data.

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Corporate Exploration Strategies, available to subscribers on the Internet and in print, is now in its sixteenth edition. This annual study is the industry's standard reference on competitors' exploration spending and strategies, and worldwide exploration trends.

Strategies for Gold Reserves Replacement

Strategies for Gold Reserves Replacement, to be published in June 2006, will present a detailed and practical look at how major companies are replacing their gold reserves. The study includes reserves and production profiles for major gold producers since 1995 (as available), gold discoveries, exploration budgets, acquisitions, and the gold project pipeline. So that subscribers can do their own analysis, the underlying information will be available online for downloading.

A similar study, Strategies for Copper Reserves Replacement, was published in June 2005.

Acquisitions Services

The Gold Acquisitions Service and the Base Metals Acquisitions Service give Metals Economics Group clients a competitive edge in gold and base metals acquisitions by reporting on and analyzing current and historical (back to 1995) acquisition activities in late-stage projects, operating mines, and companies.

Junior Gold and Base Metals Services

Our analysts help you make sense of the hundreds of junior company news releases each week by identifying and summarizing all the significant new discoveries; resource and reserve announcements; exploration agreements, mergers, and acquisitions; and financings. Past activity is available in a searchable database going back to 1997.

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