

in this issue

Page 2

Putting our Principles into Practice

By Wayne Murdy, Newmont and Ernst Ligteringen, GRI

Page 4

Balancing compelling needs and goals

By Bobby Godsell, AngloGold Ashanti

Page 6

How to enhance the socio-economic benefits of mining in developing countries

By Olle Östensson, UNCTAD

Page 8

Materials stewardship: the route to eco-efficiency

By Kevin Brady, Five Winds International

Page 10

Partnering for Success

By Jane Nelson, Harvard University

Alcoa one of top 3 "sustainable corporations"

Page 12

ICMM Work Programme for 2005

ICMM speaks out

Page 15

ICMM publications corner

Page 16

Good Practices... Zero Waste Recycling of Metals

Also:

ICMM launches HERAG project

New ICMM member: Lonmin

Safety benchmarking workshop

...and more



1

AWARD-WINNING PROCESS YIELDS NO HAZARDOUS WASTE PAGE 16

ZERO WASTE RECYCLING OF METALS

ICMM

International Council
on Mining & Metals

Contact information

ICMM
19 Stratford Place
London W1C 1BQ
United Kingdom

Telephone: +44 (0) 20 7290 4920
Fax: +44 (0) 20 7290 4921
Email: info@icmm.com
Web: www.icmm.com

www.icmm.com

ICMM's tenth sustainable development principle:

to "implement effective and transparent engagement, communication and independently verified reporting arrangements with our stakeholders."



Putting our Principles into practice

By Wayne Murdy, Chairman and Chief Executive Officer of Newmont and Chair of the ICMM Council

In January 2005, ICMM's 16 corporate members agreed to report on their sustainable development performance "in accordance with" the GRI Sustainability Reporting Guidelines and its Mining and Metals Sector Supplement. The target date for achieving this pledge is within two reporting cycles. By using the GRI framework, ICMM members will fulfil their commitment to measure their performance against the ICMM sustainable development principles (see side box). ICMM's Chairman, Wayne Murdy, believes this is an important milestone for ICMM and for the mining and metals sector as a whole.

A major step in our industry's sustainable development journey was achieved early this year. The 16 corporate members of ICMM reached unanimous agreement to report "in accordance with" the GRI Guidelines and the recently completed Mining and Metals Sector Supplement.

This will take to 67 the number of companies around the world reporting "in accordance" with the GRI Guidelines, with ICMM's support effecting a 30 per cent increase in the near future. We have set ourselves a demanding target – to achieve this in two reporting cycles. In doing so, we recognise that some ICMM members may be closer to this target than others, who could take an additional reporting cycle.

Greater transparency and comparability

Our hope is that this new commitment, and the process that led to it, will help us achieve greater transparency in how we report on our operations and their social, environmental and economic impacts. In addition, we trust that our collective use of the GRI framework will allow stakeholders to compare the performance of ICMM member companies in a structured manner. Our overall aim is to improve – and provide the tools for others to help us improve – our performance.

Arriving at this junction has been a challenge and a tremendous learning experience for all involved. In May 2003, the ICMM Council approved a set of ten sustainable development principles and committed its corporate members

to measure their performance against them. This established the basis for the ICMM Sustainable Development Framework, which consists of:

- the 10 principles, www.icmm.com/icmm_principles;
- the ICMM reporting framework, developed in partnership with the GRI;
- a verification system that we will develop throughout 2005; and
- an online library offering good practice guidelines, standards, case studies, legislation and other relevant material, www.goodpracticemining.org.

A participatory approach

Over the last 18 months, we have worked closely with the GRI to develop a Mining and Metals Sector Supplement. What has added to the value of this is that it has been a multi-stakeholder process.

"Our overall aim is to improve – and provide the tools for others to help us improve – our performance."

A Working Group, whose members were drawn from industry, finance, labour and social and environmental NGOs, achieved a principled consensus following four intense and productive meetings. The constructive and collegial approach we have pioneered is a positive indicator for the future endeavours of the mining and metals sector.

Consistent data improves performance

As heartening as this progress has been, we should not underestimate what remains to be done to embed this reporting framework within ICMM member companies and ensure consistency in the way data is gathered to help improve performance. Already, ICMM staff have briefed practitioners in Japan and Australia about the issues involved in design and implementation. They plan to follow this up with similar briefings in other regions of the world.

We are aware of the long way we have ahead of us but I am confident that the success of this process signals a more positive future. In making our reporting practices more transparent we are laying a crucial foundation for not only improving our performance "on the ground" (and underground) but also for enhancing the quality of our dialogue with stakeholders. By working together, we can demonstrate that our members are committed to listening and taking positive action towards sustainable development.

The ICMM Reporting Framework

To fulfil their commitment to measure performance against the sustainable development principles, ICMM corporate members agree to report using the GRI Framework, that is the 2002 Sustainability Reporting Guidelines and Pilot Sector Supplement, as follows:

- for the next reporting period, report informally against the GRI Framework, including a content index of where information relevant to the GRI Framework can be found in the report. For example, for those members reporting on a calendar year basis this would be for the 2005 report, published during 2006.
- as soon as practical, report "in accordance" with the GRI Framework. The target date for achieving this is within two reporting periods (for example, for those members reporting on a calendar year basis this would be for the 2006 report, published during 2007), however, it is recognised that some members may require an additional reporting cycle.

This commitment is based on the GRI's 2002 Sustainability Reporting Guidelines, including the current definition of "in accordance". The GRI is about to commence a review of the Guidelines and ICMM will participate in this process.

The Sector Supplement is available on the ICMM website, www.icmm.com. Translations into Japanese, Spanish, French and Portuguese will be available in the coming months.

Supporting the reporting framework's implementation

Two information sessions were held with member companies, associations and consultants to assist them in understanding and using the GRI framework. These were carried out in partnership with the Minerals Council of Australia and with ICMM's Japanese members respectively. Future activities to support ICMM's reporting commitments are being organised.

Partnering with ICMM for the creation of the Mining and Metals Sector Supplement

By Ernst Ligteringen, Global Reporting Initiative Chief Executive

The completion of the Mining and Metals Sector Supplement in partnership with ICMM shows that members of ICMM value both the openness that the reporting process fosters and the multi-stakeholder approach in working towards a common goal. That ICMM members have also decided to aim for the highest level of disclosure by reporting "in accordance" with the Guidelines clearly indicates a desire to work towards greater trust through transparency and to take the next step that currently distinguishes the leading GRI reporters.

GRI Sector Supplements are an integral component of the GRI Reporting Framework, enabling organisations to target more effectively the issues and actions that distinguish their sector. By providing additional guidance on how to report on existing indicators, or through creating new ones where applicable, the Sector Supplements are designed to complement the generally applicable GRI Sustainability Reporting Guidelines, with the result being the development of more robust and meaningful reports that are also more comparable within an industry.

To make Sector Supplements as useful as possible, GRI partners with all relevant stakeholders to incorporate their expertise and concerns. This also ensures the end result is credible and balanced and demonstrates the commitment of those in the industry to transparency and sustainability.

ICMM members now join the top group of "in accordance" reporters, who currently make up just under 10 per cent of all current reporters. As of 20 January 2005, there were 625 organisations worldwide that had produced one or more sustainability reports based on the GRI Sustainability Reporting Guidelines, with a total of only 51 of these reports identified as being "in accordance" with the GRI Guidelines. Being "in accordance" means the reports have met five criteria, including responding to each core indicator and featuring a statement signed by the CEO. Since this is designed for reporters that are ready for a high level of reporting and who seek to position themselves as leaders in the field, the decision to report "in accordance" with the Guidelines is an option, not a requirement.

ICMM members' voluntary commitment is based on the GRI's 2002 Sustainability Reporting Guidelines and the pilot version of the Mining and Metals Sector Supplement released in early 2005. The GRI has commenced a process to review and update the Guidelines with ICMM members. The third generation of GRI Guidelines (G3) will be released in 2006.

“Biodiversity, Science and Governance”

ICMM attended the France-UNESCO workshop entitled “Biodiversity, Science and Governance” in Paris on 24–26 January 2005. The event was

opened by French President Jacques Chirac and a host of other dignitaries, including Marc Ravalomanana, President of Madagascar, and Kenyan Nobel Peace Prize laureate, Wangari

Maathai. Other participants included academic and government officials. ICMM contributed to the poster session with a display on mining and biodiversity.

www.icmm.com

to “contribute to conservation of biodiversity and integrated approaches to land use planning.”



Balancing compelling needs and goals

By Bobby Godsell, Chief Executive Officer of AngloGold Ashanti

Mining and biodiversity conservation need not be at odds. As history has shown, extreme positions will not result in progress for world populations and environments. ICMM members believe that operations that are managed responsibly can help preserve biodiversity and alleviate pressures from poverty in biodiversity-rich areas. Bobby Godsell, CEO of AngloGold Ashanti, participated at the recent World Conservation Forum organised by IUCN – The World Conservation Union in Bangkok, Thailand in November 2004. He explains below why the industry, conservationists and other stakeholders need to work collaboratively to meet the challenges of biodiversity conservation.

Miners and conservationists are not as far apart as one might think. Ultimately, both sides share a dream of economic growth, social development and environmental conservation.

It is possible to form a caricature of the Machiavellian capitalist CEO whose motto is “greed is good”. Gordon Gecko, the high flying speculator from the movie Wall Street, coined this phrase and epitomised the capitalist who will stop at nothing and will step on anyone and anything to make more money. Such people are the stuff of movies and do not exist in real life. My family and I do not want to live in a world that has been laid waste by unrestrained growth and poor environmental practice. Neither do we want to bear witness to rampant poverty and need. We want to enjoy wide open spaces, clean air and untouched beaches. We want to see our continent prosper and our countrymen and women enjoy fulfilling and healthy lives. So capitalists, and I am proud to be one, have a stake in good environmental conservation and economic growth, and want to see these objectives delivered.

Equally, there is the stereotype of the environmentalist, who lives in the North, wears poorly fitting clothing, has unkempt hair and plots global campaigns on his laptop from the safety of his wealthy parents’ home. He, too, does not exist in reality. Environmentalists have a stake in economic growth because they benefit from the trappings of the 21st century and the security they bring. Rightfully, they want others to enjoy these benefits too.

Thus we must exorcise the demons of these two different sides and accept that we are united in our humanity and in the similar needs and goals that we share.

Towards common goals

However, in aiming towards common goals of economic growth, environmental conservation and social development, important tradeoffs need to be made. This side of heaven, people face tough choices. We do not live in nirvana, where perfection is possible. Instead, though we are seldom faced with a stark choice between environmental conservation and economic development, we often have to choose a lower level of growth to achieve a higher level of conservation, and vice versa. I do not subscribe to the belief that environment and economic growth are mutually conflicting – that is clearly often not the case. However the fact remains that, in this imperfect world, we often have to make difficult decisions.

“We are united in ... the similar needs and goals that we share.”

I have said that I have a big stake in environmental conservation. Conservation requires the establishment of special areas where species, ecosystems and habitats are looked after. However, conservation does not only take place in parks. Nor are parks the panacea for all our conservation needs. Recent analysis of gaps in protected area coverage has shown that much of the most threatened biodiversity lies outside protected areas. This suggests that a broader approach to conservation, involving a wide range of stakeholders, is needed.

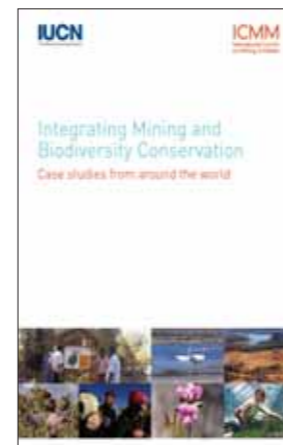
Mining projects offer real opportunities to enhance biodiversity conservation. For example, exploration projects are often situated in remote locations and, when working in partnership with biologists, can help improve our knowledge of the distribution of species. Companies’ revegetation activities can re-introduce plant species into environments where they may have been threatened. Additionally, community development programmes can increase the local knowledge needed to make these projects sustainable.

There is no shortage of possibilities for mining companies to be engaged and ICMM’s dialogue with IUCN will surely uncover many other new ways of doing this. Progress is already being made as ICMM members are working on numerous initiatives. These include assessments and conservation of unique fauna and flora, research and development, support for protected areas management and proactive community development programmes. Many have also established partnerships with conservation groups, which are already delivering positive outcomes on the ground.

However, the industry will not fulfil its potential if it works in isolation. Experience has shown that much can be accomplished through stronger collaboration between the mining and conservation sectors. The engagement of governments, international organisations, community groups and others is just as essential. It is only through a broader approach that underscores a shared responsibility that we will realise our dream of economic growth, social development and environmental conservation.

Whichever stereotype we subscribe to, we all share the human condition and the needs, aspirations and possibilities that come with it.

Integrating Mining and Biodiversity Conservation: Case studies from around the world



IUCN and ICMM co-published this compilation of 17 case studies. Each provides a brief background on the issue, describes either the steps taken to resolve any differences or the programme introduced to address the problem, and then outlines the lessons learned in the process. New partnerships is one recurring theme throughout.

The publication can be downloaded from www.icmm.com. Hard copies can be requested by writing to info@icmm.com.

Implementing commitments to biodiversity conservation

ICMM’s seventh principle includes commitments to “disseminate scientific data on and promote practices and experiences in biodiversity assessment and management” and to “support the development and implementation of scientifically sound, inclusive and transparent procedures for integrated approaches to land use planning, biodiversity, conservation and mining”.

To assist ICMM members meet these commitments, ICMM began two projects in 2004 – the preparation of a good practice guidance document in biodiversity conservation for mines and of a discussion paper on biodiversity offsets. Both projects are part of ICMM’s dialogue with IUCN – the World Conservation Union.

The guidance document, aimed at general managers and senior environmental personnel, sets out the reasoning around biodiversity management and conservation and what to do to achieve it. It covers the life cycle of mining projects, from exploration, through pre-feasibility and feasibility studies, and the operational stage to mine closure. Additionally, it seeks to integrate biodiversity into assessments of social, environmental and community issues. A “provisional guidance” document will be published initially, with a revised version anticipated following a period of field testing and public consultation.

The discussion paper is intended to assist the growing debate on the use of biodiversity offsets to compensate for impacts of mining operations. It will set out the issues and frame questions to promote discussion among interested parties with a view to reaching conclusions or at least a better understanding of the issues involved. This should lead to the subsequent publication of a good practice guidance document.

A joint ICMM-IUCN advisory group is overseeing the projects through meetings (most recently at the World Conservation Forum in November 2004) and teleconferences. A good, productive rapport has been established among the group.

IUCN’s World Conservation Forum in Bangkok was a good occasion to inform the conservation community about progress with the IUCN-ICMM dialogue, and the status of these projects. At the World Parks Congress in September 2003, many participants were manifestly opposed to fostering a dialogue between the conservation and business communities about biodiversity. However, at the Bangkok meeting, numerous high-level statements drew attention to the imperative that conservation and business groups engage with each other. While there were still some determined opponents to the dialogue, the session was constructive and demonstrated the value of pursuing good communication and remaining open to exchanging ideas across the spectrum of views.

ICMM members are taking a leadership role on this crucial public policy issue. But enhancing the socio-economic benefits of mining in

developing countries calls for concerted action. If you are interested in finding out more about this study, write to info@icmm.com.

to "contribute to the social, economic and institutional development of the communities in which we operate."



How to enhance the socio-economic benefits of mining in developing countries

By Olle Östensson, United Nations Conference on Trade and Development (UNCTAD)

The debate over the existence of a so-called "resource curse" has been occupying the attention of the mining and metals industry for years. The idea that resource development does not always contribute to economic growth and poverty reduction is one that has fervent supporters and opponents. ICMM's recently initiated Resource Endowment study is designed to assist mineral-rich countries to use their mineral resources to achieve broad-based economic growth and poverty reduction. In this article, Olle Östensson from UNCTAD and an ICMM partner in this study sets out why the project is important.

For some decades now, a debate has raged about the "resource curse", according to which mineral and oil rich countries have often suffered rather than benefited from their natural resources. On one side of this debate are those pointing to resource-rich countries that have experienced slow growth and little economic diversification and where poverty, conflict, corruption and other problems remain rife.

Those on the other side of the debate point to countries such as Botswana, Chile and, from a historical perspective, Australia, Canada and the United States. All depended on mineral exploitation to help power successful development.

However, underlying the debate is a set of policy and practical questions, which all will agree deserve more attention:

- *What are the precise factors of success that allow some countries to benefit from their resource endowments?*
- *What practical steps can be taken to build in these factors where they are lacking?*
- *What are the factors underlying success on a micro level in ensuring that individual mining projects create real, long-lasting benefits for local communities and economies?*

Answering the key questions

The objective of the ICMM Resource Endowment study is to learn from successful countries and successful projects. The output will

be a set of recommendations for companies, national and local governments and other key organisations, which will include tools to identify the key determinants of success in different operating environments. We expect that these will inform companies' investment decisions and capacity building efforts in order to enhance the socio-economic contribution of the mining and metals sector in developing countries.

It should be emphasised that the answers to some of these questions are already known, at least in broad terms. At a macro-level, for example, it is clear that governments need to carefully manage exchange rate fluctuations resulting from mineral export

"...working to translate rhetoric on sustainable development into results..."

booms, and also invest revenues from mining wisely over the long term. However, less well understood are the types of underlying socio-economic and political conditions, as well as governance structures, which make it possible for some countries to enact sound policies, while others do not. Conditions for success need to be identified and fostered, and the potential roles of both international organisations, such as the World Bank and others, and companies in encouraging them need to be defined in a way that recognises the sovereignty of host governments.

At the regional and project levels, there is a need to understand better why, and how, certain projects have achieved more positive results than others. Questions to be asked include:

- *What has been the contribution of individual mining projects to community and regional development?*
- *Which policies have been most effective in delivering wider economic benefits?*
- *How should responsibility for the overall task of maximising local benefits be divided among governments, companies, international organisations and NGOs?*

Progress to date

The research itself is being undertaken by consultants specialising in development issues. The World Bank and the United Nations Conference on Trade and Development (UNCTAD) are also participating in the research. Phase 1 findings were reviewed at a workshop in November 2004 (See side box) in which key stakeholders from governments, international organisations, investors, banks who have adopted the Equator Principles, and NGOs participated.

Phase 2 of the project was launched in January 2005. This will comprise testing the approach developed in Phase 1 in two primary country case studies, on Ghana and Peru. These will be benchmarked against issues and projects in other similarly situated countries. Ghana may be compared to Tanzania while Peru may be compared to Chile. The focus of the case studies will be on "success factors" and "good practice" rather than "successful countries" or model interventions, given that Phase 1 of the work has demonstrated that success at country or project level is usually relative and does not extend to all aspects.

Following completion of the research (expected in late 2005), policy recommendations will be communicated widely and tool kits will be disseminated in order to support reform and improved operational practices.

Advisory Group

An Advisory group has been established to provide independent oversight on the project and guidance on its substance, scope and quality. It is certainly important from our perspective that its results are of the highest objectivity, quality and rigour with the hope that this critical issue for all mineral-rich countries will be a step closer to solution.



Mineworkers at AngloGold Ashanti's Obuasi mine project in Ghana. Ghana will be one of the study's primary country case studies.

Advisory Group members

- **Georg Kell, Executive Head, UN Global Compact**
- **Pedro Pablo Kuczynski, Minister of Economy and Finance, Peru**
- **Mamadou Lamine Loum, President, International Advisory Group, Chad Cameroon Petroleum Development and Pipeline project**
- **Warwick McKibbin, Professor of International Economics, the Australian National University; Professorial Fellow, The Lowy Institute for International Policy; Member, Board of the Reserve Bank of Australia**
- **Hon. Felix Mutati, Deputy Minister of Finance and National Planning, Zambia**
- **Jane Nelson, Senior Fellow and Director of the Corporate Social Responsibility Initiative at the Kennedy School of Government, Harvard University**

November Workshop

A workshop attended by 60 participants was held in London on 29-30 November 2004 to launch and obtain feedback on phase one of ICMM's Resource Endowment project. The key messages from the workshop were:

- **Agreement that the project will provide an innovative, analytical framework and much needed tools to enhance development effectiveness**
- **The importance of focusing on the ingredients for success, that is, good practice, in order to provide useful tools; and**
- **The need to integrate the macroeconomic governance, regional and project level components of the project in a single analytical framework**

The next steps:

- **The World Bank Group and the UNCTAD will also contribute case studies and input at the micro level.**
- **A revised integrated draft toolkit was produced in February 2005**
- **First testing of the toolkit will take place in Ghana in February and March 2005; and**
- **The final workshop and subsequent project launch are likely to take place in the second half of 2005**

ICMM will participate in the International Conference on Life Cycle Assessment 2005 to be held in San Jose, Costa Rica on 25–28 April. This will be the first time that this conference, held every two

years, will be convened in Latin America. The event will be organised under the auspices of the UNEP/SETAC Life Cycle Initiative of which ICMM is a founding partner.

Topics to be covered include, product policy, life cycle management, green building, and materials and waste management. The meeting will provide an opportunity for ICMM to present

information on its work towards improving the characterisation of metals ecotoxicity in life cycle impact assessment.

www.icmm.com

to “facilitate and encourage responsible product, design, use, re-use, recycling and disposal of our products.”



Materials stewardship: the route to eco-efficiency

By Kevin Brady, Director, Five Winds International

In early times, the transition from a hunter gatherer society to an agrarian model was a substantial change to the way people used natural resources. The principal idea driving the change was one of stewardship, based around better husbanding and harvesting of sustainable and accessible food. According to Kevin Brady, who here revisits the findings of the paper on Eco-efficiency and Materials (published by ICME in 2001) the comparison between that earlier society transition and today's resource companies suggests that a stewardship strategy of “tending” the world's supply and use of metal resources will lead to a more sustainable supply.

The concept of eco-efficiency is not new. It was first introduced by the World Business Council for Sustainable Development (WBCSD) in 1992. However, over the past decade, eco-efficiency has emerged as a powerful concept that can guide businesses in their attempt to shift toward more sustainable forms of production and consumption.

Eco-efficiency can be broadly defined as the production, delivery, and use of competitively priced materials, goods and services, coupled with the achievement of improved environmental performance. Its attractiveness as a concept for both industry and government is found in the link between resource and energy efficiency, environmental performance and competitiveness. The concept spans the entire value chain (suppliers, manufacturers or service providers, consumers, etc.) and the complete product life cycle (raw materials, manufacturing processes, use phase impacts, and end-of-life management). It seeks to identify improvement opportunities in all of these categories.

While eco-efficiency does not address social aspects of sustainable development, there is no question that eco-efficiency has been a key entry point for industry to gain an understanding of the business value of pursuing sustainability.

Since its creation by the WBCSD, the application of eco-efficiency has centred on integrating environmental and life cycle cost considerations into core business processes. To support this integration, a variety of “eco-efficiency” tools and evaluation models have been developed to help decision-makers make the

right choices to improve their operations, products and services. While many existing evaluation tools could do a better job to make these choices easier, the starting point for materials eco-efficiency is to recognise the differences in the underlying properties of materials, as we have shown in Box 1. These properties point to the need for different management strategies:

- For wood and paper, the primary strategy is to maintain the integrity and productivity of the living resource stock (i.e. the forest resource base).
- For plastics, the primary strategy is to maximise the benefit of the product, taking advantage of the versatility of each molecule and its application in the product cycle to ensure efficient and responsible use of the plastic product.

This will ensure continued existence of the resource and protection of ecological services and might be called *resource eco-efficiency*, natural resource stewardship, or forest stewardship.

With much of the material stock used only once or having limited ability to be “renewed”, responsibility is placed on the product cycle to make the best use of the resource. This might be called *product eco-efficiency*, or a *product stewardship* strategy.

- For metals, the primary strategy is to maximise the utility of the metal element.

The elemental nature of metals means they are theoretically infinitely recyclable. This points to a *metal stewardship strategy*, or *materials eco-efficiency approach*, that focuses on “mining the infrastructure of society” (e.g. cars, electronics, buildings) to recapture the metals and reutilise them.

For all these materials there is an obligation to pursue process eco-efficiency. This ensures minimisation of environmental impacts at the operational level, including the management of risk. Issues such as process energy efficiency, pollution prevention and limiting ecological disturbances are captured in process eco-efficiency.

In the forest products and the plastics industries, the strategies we have outlined are being supported by sustainable forestry initiatives and *Responsible Care*. The Forest Stewardship

Council's sustainable forests certification programme is an example of a stewardship programme that is attempting to ensure the sustainability of the resource base. *Responsible Care* provides codes of practice that ensure responsible stewardship of chemicals and plastic products.

In the metals and mining sector there is now considerable dialogue about a material stewardship strategy. In our view this is the logical focus for the sector's sustainability efforts but for some it will require a re-conception of what it means to be a metals and mining company. A stewardship strategy, guided by a material eco-efficiency approach, will require closer cooperation with the users of metals (e.g. electronic equipment and automobile manufacturers). It will also necessitate the design and implementation of more and better mechanisms for “harvesting” metals from products at the end of their life. While a material stewardship approach may be more complicated than selling into the London Metals Exchange, it will enable metals and mining companies to develop deeper relationships with the users of metals. This will foster a better understanding of the sustainability attributes of metals and it may also lead to new applications of metals.

We believe the transition to a material stewardship strategy is timely and inevitable given some of the significant market and regulatory drivers that are calling for this kind of approach (See Box 2). Interpreted in this way, eco-efficiency has the power to transform businesses focused solely on prospecting, mining and commodity marketing into materials management businesses.

The main ideas in this article are drawn from the International Council for Metals and the Environment 2001 publication entitled, Eco-efficiency and Materials, authored by Steven Young, Kevin Brady, James Fava and Konrad Saur.

Box 1. Characteristics of three common material types

- **Wood and paper** are cellular in structure, with cells mostly organised into fibres which determine the properties and integrity of the material.
- **Plastics** are molecular in structure, principally chains of carbon-carbon molecules, with the ability of single monomers to link together in an almost infinite number of combinations to allow engineering of polymers with specific properties.
- **Metals** are elements and this gives them their basic material value. Different metals have different physical and chemical properties due to atomic-level characteristics associated with metallic bonding. As elements, they cannot be destroyed and are therefore theoretically infinitely recyclable.



In response to the widespread use of portable electronic devices, Umicore has applied the concept of eco-efficiency in a new process for recycling lithium-ion batteries. These are commonly used to power mobile technologies (see back cover). Eco-efficiency was achieved through the elimination of hazardous waste in the recycling process.

Box 2. Drivers for Materials Eco-efficiency

- **The outcome of the World Summit on Sustainable Development in 2002 where national governments renewed their commitment to sustainable development and reaffirmed the role of eco-efficiency in accelerating a societal shift to cleaner and more sustainable forms of production and consumption.**
- **A growing tool-box and body of expertise (e.g. standards and guidance on design for environment and life cycle assessment) that supports the integration of eco-efficiency into product design and development in key metal markets such as automotive, electronics and building and construction.**
- **Specific regulatory actions in key sectors that are driving product manufacturers to take responsibility for their products at the end of their useful life (e.g. the European End-of-Life Vehicle Directive).**
- **Business to business and government procurement initiatives that are utilising a range of evaluation approaches to improve the sustainability of goods and services purchased.**
- **Increasing attention from governments, leading companies, and certification and labelling programmes on evaluating the life cycle environmental impacts of products and materials to enable the selection of desirable materials and products.**
- **The United Nation Environment Programme's global programmes on Sustainable Consumption, Cleaner Production and the Life Cycle Initiative, which support national governments in the adoption of tools and strategies to improve the sustainability performance of industry.**
- **The growing sophistication of the capital markets in understanding and evaluating the relationship between sustainability performance and shareholder value.**

New references on good practice online library

A number of new, recently released references have been added to the online library of good practice in the mining and metals sector. These include the Minerals Council of Australia's Enduring Value document, a guide on HIV/AIDS

developed by the World Bank, and MIRM Gate, a hazard and risk management resource.

The online library was launched in 2004 to provide a resource for the implementation of good practice in

mining and metals operations around the world. The site was developed by the UK's Department for International Development, ICMM, the United Nations Environment Programme and the United Nations Conference on Trade and the Environment.

www.icmm.com

The site is continually being improved and updated. Feedback and suggestions for new material are always welcome. Visit the Good Practice website at www.goodpracticemining.org.

Partnering for Success

By Jane Nelson, Corporate Social Responsibility Initiative, Kennedy School of Government, Harvard University

We live in an era of immense wealth creation, technological innovation, and political emancipation. Yet, almost two-thirds of the world's population still lacks access to basic services, efficient markets, and good governance. This lack of opportunity condemns millions of people to abject poverty. It undermines economic growth and environmental sustainability. And it underpins conflict and instability. It also represents billions of dollars' worth of untapped business opportunities – for micro-enterprises, small businesses, national companies, and multinational corporations alike – to help deliver solutions that spread the benefits of development more widely.

One of the key leadership challenges of our time is to find new ways to harness the innovation, technology, networks, and problem-solving skills of the private sector, in partnership with others, to support international development goals. And to do so in a manner that makes sound business sense and does not replace or undermine the role of government. Business leaders have a growing interest, both in terms of risk management and harnessing new opportunities, to get engaged.

There are already pioneers. Some of the world's most successful companies are recognising the potential to turn innovative solutions to development challenges into profit-making ventures and new forms of social investment. They are also acknowledging the growing risks of inaction. Developing economies represent important future markets. Yet, in many cases there are market failures or failures in governance and weak public administration or infrastructure in these economies. New types of partnerships aimed at expanding economic opportunity, serving unmet social and environmental needs, and improving governance structures are becoming an important approach to address such challenges. These partnerships range from global coalitions to nationwide initiatives and local community projects. They include mainstream business alliances, strategic philanthropy activities and public policy dialogues.

The January 2005 World Economic Forum (WEF) report, "Partnering for Success," looks at some of these innovative approaches. Based on this year's survey of participants in the WEF's Global Corporate Citizenship Initiative (GCCCI), the report profiles over 40 diverse partnerships – all of them involving one or more members of the GCCCI, among which are many ICMM

members. Between them, these alliances have engaged thousands of different partners around the world, and leveraged millions of dollars in cash and in-kind resources. The most effective initiatives have mobilised core corporate competencies and are focused on addressing the development challenges that create the greatest opportunities for the participating companies.

The message is clear. Multiple stakeholder partnerships are neither easy nor a panacea. They often have high transaction costs and are difficult to establish and sustain. Many are new and untested. Yet, they offer an important new approach that has the potential to drive innovation, improve governance, raise living standards, and provide opportunity to millions of people. They deserve continued support, engagement, and evaluation from business leaders.

This article is an excerpt from "Partnering for Success: Business Perspectives on Multistakeholder Partnerships," published by the World Economic Forum's GCCCI in cooperation with the International Business Leaders Forum and the Center for Business and Government, Kennedy School of Government at Harvard University. The report was released in January 2005 and is available from www.wef.org.

A commitment to partnerships

- **With the World Bank, ICMM is developing new approaches to community development through our Community Tools project**
- **With the Global Reporting Initiative, ICMM has developed a Mining and Metals Sector Supplement to the GRI 2002 Sustainability Reporting Guidelines**
- **ICMM has a dialogue between IUCN – the World Conservation Union on mining and biodiversity conservation.**
- **With the United Nations Environment Program (UNEP), ICMM is finalising a project to minimise the occurrence and harmful effects of emergencies**
- **With the World Bank and the United Nations Conference on Trade and Development, ICMM is conducting its Resource Endowment study**

Alcoa one of top 3 "sustainable corporations"

ICMM member, Alcoa, has been named one of the top three sustainable companies in the world. The award was made during a ceremony at the recent World Economic Forum in Davos, Switzerland in January.

Alcoa, Toyota Motor and BP, were all recognised for their ability to meet "the triple bottom line", a measure of value that balances the environmental, social and economic impacts of a business. These three companies topped the list of the Global 100 Most Sustainable Corporations, which was announced in Davos.

Following the awards ceremony, Alcoa Chairman and CEO Alain Belda said he was honoured to see the work of Alcoans recognised globally.

"Sustainability is not new to us, although we may not have always used the term. For years we have been using our values as a guide while striving for excellence with a focus on better understanding and managing our economic, social and environmental impacts with our communities," Mr Belda said.

"Our values require us to think and act not only on the present challenges, but also with the legacy in mind that we leave for those who will come after us... as well as the commitments made by those that came before us.

"We think of it in terms of a relay race, where each one of us adds value today and long-term for all shareholders, Alcoans and the communities in which we operate. We appreciate the recognition of this work and our ability to combine financial performance with social and environmental stewardship," Mr Belda added.



Alain Belda
Chairman and CEO, Alcoa

Sustainability can add financial value

Alcoa has recognised that sustainable development programmes add financial value. The company is expecting its efforts to create environmental and energy cost savings of US\$100 million by 2006.

An example of such Alcoa projects is its efforts to promote the use of aluminum in transportation applications, where aluminum – by virtue of its excellent strength-to-weight ratio – is making inroads as a material of choice that allows automakers to build low-weight, fuel efficient vehicles that produce fewer tailpipe emissions.

Alcoa is headquartered in the United States and has 131,000 employees in 43 countries.



Aluminium production begins with bauxite ore, mined by Alcoa in Australia, Jamaica, Brazil, Africa, Suriname and other locations. Alcoa believes that after mining is finished, the land must be fully rehabilitated. Here, Alcoa workers in Australia are collecting native seed as part of a mine rehabilitation project

Detailed information on ICMM's work programme, specific projects, and other activities is available at www.icmm.com. The site is currently being updated and re-vamped and will be re-launched in April 2005.

The **Prospectors and Developers Association of Canada** (PDAC) will hold its yearly conference in Toronto, Canada on 6–9 March 2005. ICMM will have an exhibition booth at the event.

The **Asia Mining Congress 2005** will be held on 22–24 March 2005 in Singapore. The theme will be "Fuelling Global Demand". ICMM's Secretary General, Paul Mitchell, will give a keynote address in the event's opening session.

ICMM Work Programme for 2005

ICMM speaks out Workshops, annual meetings and conferences

Over the course of 2005, ICMM will carry out the following projects and activities. These have been designed to support the ICMM sustainable development principles (see side box) and enable ICMM to represent the views of its members. The work programme was approved by the ICMM Council in October 2005

Driving performance improvements: the ICMM Sustainable Development Framework

- The ICMM Principles: continued outreach and dissemination
- Public reporting: pilot framework, communications and training for members **10**
- Approach to verification: review of options **10**
- Sharing good practice: ongoing development of online library, including forthcoming guidelines on tailings and support for the MIRMgate risk management database **All principles**

Enhancing our members' environmental performance

- Good practice in biodiversity management: guidance document for industry **6**
 - Biodiversity offsets: discussion paper to move the debate forward **6 & 7**
 - Land-use planning: paper on integrated approaches **6 & 7**
 - Financial assurance: publication reviewing the state-of-play providing recommendations for decision-makers **6 & 7**
- (The first three activities are part of the ICMM-IUCN Dialogue)

Boosting our members' socio-economic contribution to the countries and communities where we operate

- The Resource Endowment study: report and tools to assist mineral-rich developing countries to use their resources to achieve socio-economic development **9**
- Community Development Tools: tools for enhancing socio-economic outcomes from mining and metals projects, in partnership with the World Bank **9**
- Review of issues surrounding indigenous peoples and mining: publication of key findings and roundtable as part of the IUCN Dialogue **3, 7 & 9**
- Emergency preparedness and response: case studies publication in partnership with UNEP on working with communities **4, 5, 9 & 10**

Continuous improvement of our members' health and safety performance

- Occupational exposure limits for metals: workshop and position paper advancing a harmonised approach **5**
- Health and Safety database: online database of member safety standards **5**

Promoting regulations that are based on sound science and foster sustainable development

- Good practice guidance on minerals and metals risk assessments **4**
- Hazard assessment models and tools: development of the Unit World Model as the basis for a minerals and metals hazard screening tool **4**
- Peer review and technical policy development: continued sponsorship of the Ecotoxicity Technical Advisory Panel and support for the Minerals and Metals Technical Working Group **4**

Promoting and facilitating materials stewardship

- Materials eco-efficiency: guidance document on its application to encourage greater application of the concept **8**
- International chemicals management: participation in PrepCom 3 of the UN's Strategic Approach to International Chemicals Management and involvement in REACH **4 & 8**
- Materials stewardship: guidance document on its application and presentations to key user forums **8**
- Assessment of metals recycling activity: report on 'how to' for compilation and assessment of metals recycling data **8**
- Life cycle assessment and management techniques: ongoing partnership with the UNEP/SETAC Life Cycle Initiative **4 & 8**

Bringing ICMM's perspective and experience to global forums

- IUCN-ICMM Dialogue: involvement in review of IUCN's Protected Areas Category Management System and a round table meeting on indigenous peoples issues **7 & 10**
- Joint project with ICEM and ILO on mine safety in China **5**
- Extractive Industries Transparency Initiative (EITI): continued participation in EITI's formal "Core Group" **1 & 10**
- Global Dialogue of Governments: ongoing participation as observers in this key forum for our sector **9 & 10**
- ISO Social Responsibility Standard: involvement to gather lessons from similar processes **10**
- IFC Safeguards and Guidelines Reviews: submissions on the new proposed performance requirements and guidelines and the disclosure policy **10**

ICMM Principles

- 1 Implement and maintain ethical business practices and sound systems of corporate governance.**
- 2 Integrate sustainable development considerations within the corporate decision-making process.**
- 3 Uphold fundamental human rights and respect cultures, customs and values in dealings with employees and others who are affected by our activities.**
- 4 Implement risk management strategies based on valid data and sound science.**
- 5 Seek continual improvement of our health and safety performance.**
- 6 Seek continual improvement of our environmental performance.**
- 7 Contribute to conservation of biodiversity and integrated approaches to land use planning.**
- 8 Facilitate and encourage responsible product design, use, re-use, recycling and disposal of our products.**
- 9 Contribute to the social, economic and institutional development of the communities in which we operate.**
- 10 Implement effective and transparent engagement, communication and independently verified reporting arrangements with our stakeholders.**

ICMM participated at the **MinExpo 2004** event which was held in September 2004 in Las Vegas, United States, with its Secretary General, Paul Mitchell, giving a keynote address at the Caterpillar Forum on Sustainable Development in Mining on 25 September, and addressing MineExpo's International session organised by the US's National Mining Association on 27 September.

The **Minerals Council of Australia's 2004 Inaugural Global Sustainable Development Conference** entitled "Partnerships and pathways to implementation" was held in Melbourne, Australia from 25–29 October 2004, with the ICMM's Secretary General Paul Mitchell addressing the "Due Diligence" session.

In November 2004, ICMM participated in a session at the BSR conference entitled "**The Evolving Global Reporting Initiative**". The session, attended by companies, NGOs and investors, focused on the sectoral supplements to the GRI Guidelines, which are being developed for several industries. Here ICMM shared its recent experience in the development of the Mining and Metals Sector Supplement to the GRI Guidelines, which will be used by ICMM members to report on their performance against the ICMM Sustainable Development Principles (See page 2). The supplement received positive feedback from participants.

ICMM participated in the **Society of Environmental Toxicology and Chemistry (SETAC) Fourth World Congress** in Portland, Oregon, US from 14–18 November 2004. The Congress brought together 2,800 participants and served as a platform for representatives from government, business, and academia to exchange ideas, observe current trends, and present research in their areas of expertise. At the Congress, ICMM had an exhibition booth which described its strategy on chemicals management and sustainable development, including the HERAG and MERAG projects (See page 14).

ICMM members and Secretariat staff attended **IUCN's Third World Conservation Forum** in Bangkok, Thailand from 18–20 November 2004. The Forum was one element of the overall World Conservation Congress covering the theme 'People and Nature – only one world'. The other elements were meetings of IUCN's six Commissions and Members' Business Assembly. Of the 4,800 participants at the Forum, approximately 200 were from business. Many of the participants recognised the role that business can play in biodiversity conservation including the need for increased cooperation between the private sector, government and NGOs (See page 5).

Also in November 2004, ICMM was at the **World Conference for the Mining Section of the International Federation of Chemical, Energy, Mine and General Workers' Unions (ICEM)**, which is held every four years and is attended by union leaders representing ICEM's mining affiliates from across the globe. Here, ICMM presented on the topic "Facing the Future – Implementing a Global Agenda for Sustainable Development in Mining – the Business Case".

More recently, ICMM's Secretary General, Paul Mitchell, joined business and political leaders at the **World Economic Forum** which was held on 27–28 January 2005 in Davos, Switzerland. At the forum ICMM led a session of the Mining and Metals Governors Meeting on priority issues facing the sector in the coming year. A joint GRI-ICMM communiqué announcing the commitment of ICMM members to report according to the GRI within two reporting cycles was also released in Davos.

Heads up for...

Upcoming OELs meeting

An ICMM workshop will bring together representatives of national governments, industry and academics in the field of occupational health and safety and industrial hygiene. Participants will discuss the scientific

and socio-economic foundations of "A Harmonised Approach to Setting Occupational Exposure Limits for Metals and Metal Compounds". The workshop will be held on 18–20 May 2005 in London. A report outlining ICMM's proposed approach to the

review and establishment of occupational exposure limits, prepared by the UK's Institute of Environment and Health, will provide the basis for discussion. The workshop is a significant step towards achieving, in the jurisdictions in which ICMM

www.icmm.com

member companies operate, a harmonised approach on workplace exposure limits. This approach will:

- be based on a common definition of an OEL;
- be based on sound science;

- be consistent in the application of risk assessment;
- recognise socio-economic impacts and technical achievability;
- be open and transparent to all stakeholders.

ICMM Publications

All ICMM reports, papers and case study materials are available in electronic format at www.icmm.com. Hard copies of many of them are available on request by writing to info@icmm.com

Safety benchmarking workshop

ICMM held a workshop at the University of the Witwatersrand in Johannesburg, South Africa on 25–26 January 2005 to discuss establishing a database to enable member companies and operations to benchmark their safety performance against each other. The focus of the workshop was the structure, characterisation and functionality of the database.

The workshop was well supported and included participation by representatives of Anglo American, AngloGold Ashanti, BHP Billiton, Kumba Resources, Newmont, Rio Tinto, WMC Resources, as well as the Chamber of Mines of South Africa, the Minerals Council of Australia, the University's Centre for Sustainable Mining and Industry and the IT service provider for the database.

Key issues addressed were:

- Clarification of ICMM's expectations of the database;
- The data/indicators to be provided by ICMM member companies to the database;
- Who will contribute the data and how will it be uploaded?;
- Who will access the database?;
- The structure and categorisation of the database;
- Frequency of reporting;
- Future steps and timeframe for development of the database; and
- Future development imperatives and strategic issues.

ICMM has already begun the next steps of implementation and will report back to workshop participants shortly.

Review of IFC and World Bank Environmental Guidelines

In response to a request from the International Finance Corporation (IFC), ICMM submitted in early November comments on the overarching structure and philosophy of the IFC and World Bank Guidelines. The guidelines are being reviewed as part of the process to revise the IFC Safeguards and Disclosure Policies. ICMM was thus afforded an opportunity at the outset of the process to comment on the approach we considered the guidelines should take.

ICMM's key recommendations were:

- The IFC's purpose for the guidelines and their relationship with the various IFC and WBG policies and guidelines should be stated clearly on each guideline.
- The guidelines should support and reflect a sustainable development framework.
- As far as possible, the bulk of the guidelines should transcend industry sectors and be applicable to most industries.
- The guidelines should clearly set out desired outcomes, with a requirement to carry out rigorous site-specific assessments and detailed monitoring and reporting, in the context of a management system.
- Some prescriptive standards are necessary and should be based on proven science. There should be an option to

adopt different levels of performance if the circumstances of a project warrant it.

- Several issues are inadequately covered in the current guidelines, particularly safety, health and community issues.

The IFC has welcomed ICMM's comments. The policies review is scheduled to be completed by June 2005, and it is understood that the guidelines review will commence thereafter.

New ICMM member: LonMin

LonMin became a member of ICMM in October 2004. Lonmin is the world's third largest primary producer of platinum, producing annually over 900,000 ounces and a similar quantity of other platinum group metals, such as palladium and rhodium. LonMin has operations in South Africa and conducts exploration activities in other parts of the world.

International relevance of ICMM's MERAG project acknowledged

At a recent Metals Environment Risk Assessment Guidance (MERAG) review meeting, experts from outside the European Union acknowledged the wider international relevance of MERAG. During the meeting, held in January 2005, an inter-commodity group of industry experts reviewed the consolidated draft guidance document from consultants EURAS. MERAG's principal goal is to deliver the basic information tools needed to make risk assessments for metals and inorganic materials more ecologically relevant.

With the project's scientific foundations in place, the focus is now to introduce the project to a broader audience. The scientific and technical approaches and recommendations developed in MERAG will be shared with the regulatory community at a policy review meeting in London in February. The scientific output will be reviewed in a scientific workshop in May 2005.

ICMM launches HERAG project

In support of its fourth sustainable development principle: to "Implement risk management strategies based on valid data sources and sound science", ICMM recently launched the Health Risk Assessment Guidance (HERAG) project.

HERAG will provide state-of-the-art information for chemicals management. The principal goal is delivering the basic tools to make health risk assessments for metals more scientifically valid.

The project will utilise a 'building blocks' approach similar to that employed for the corresponding environmental assessment project (MERAG) to ensure that its methodology is flexible enough to serve different jurisdictions and applications. This will enable regulators to use this material to adapt their local, national or regional assessment systems accordingly.

The HERAG project commenced in January 2005 and is sponsored by ICMM, Eurometaux and the European ferrous metals industry. A workshop, currently planned for the first half of 2006, will review the recommended scientific and

technical concepts and methodologies. The project will conclude with the publication of a guidance document in mid 2006.

ICMM recycling activity

Recycling is essential to using metals in accordance with the principles of sustainable development. However, there is little understanding and limited data about current metals recycling activities. This undermines the industry's ability to address constructively the challenges brought up by the 'sustainable consumption' agenda. ICMM is encouraging a collective industry-wide approach and identifying common problems in data gathering and barriers to increased recycling activity.

An ICMM initiative, the 'CANMET' Project on Metals Recycling in Life Cycle Assessment, aims to provide common principles and align the models used for assessing metals recycling to support life-cycle assessment and management. This project is expected to support broader business objectives of the metals industry. Some of these are:

- Alleviating market confusion concerning the selection and use of materials;
- Reducing unwarranted claims about products, services and materials; and
- Facilitating international trade.

In the current phase of this project, and in partnership with its association members, ICMM is seeking to develop a qualitative description of major metal stocks and flows. Cross-commodity interaction and cooperation is expected to help identify key metal recycling pathways. This

cooperation will be the foundation of the CANMET project, and will provide a basis for future improvements on recycling performance and efficiency within the metals sector.

In 2005, ICMM will publish a revision of the International Council on Metals and the Environment's (ICME, ICMM's predecessor) paper on non-ferrous metals recycling using current assessments of recycling activity.

ICMM, ICEM and ILO meet Chinese Government officials to discuss mine safety in China

Representatives from ICMM, the International Federation of Chemical, Energy, Mine and General Workers' Unions (ICEM), and the International Labor Organization (ILO) met with officials from the State Administration for Work Safety (SAWS), China Enterprise Confederation, China National Coal Association and the National Energy and Chemical Workers' Union of China on 30 November and 1 December 2004 in Beijing.

The Chinese Government said it welcomed the opportunity to collaborate with the international organisations to improve mine safety in China. The meeting established a commitment to explore the feasibility of developing and implementing technical cooperation activities in safety and health in the Chinese mining industry. More information available at www.icmm.com

Publications Corner

New reports, papers and case studies' series



ICMM has recently published *Financial Assurance for Mine Closure and Reclamation*. The study underpins ICMM's sixth sustainable development principle, to "seek continual improvement of our environmental performance," which includes a commitment to the design and planning of all operations so that adequate resources are available to meet mine closure requirements. It is environmental financial assurance (EFA) measures that help provide a guarantee to governments and communities that these resources will be available.

The report is intended to aid governments and companies in their discussions on the application of efficient policies in this area. The report covers a multitude of issues regarding timely and comprehensive planning for closure and beyond. It clarifies the degree to which EFA practices are currently used by mining jurisdictions and discusses the issues that arise in the application of these policies. The range and extent of actual policies in place are also discussed.

The argument for financial assurance is clearly outlined in the report along with the rationale behind the need to instigate policies that are effective in meeting environmental objectives and are compatible with a healthy investment climate.

The report was prepared by Dr C. George Miller, a mining industry expert who is a former president of the Mining Association of Canada and served as Assistant Deputy Minister, Mineral Policy in the Government of Canada.



Rehabilitation of an Anglo American exploration drill site in Namibia

Both the summary report and the full report are available at www.icmm.com. Hard copies of the summary report are available on request by writing to info@icmm.com. In addition, a related study on financial assurance for metals operations is currently in preparation.

To subscribe

The *ICMMnewsletter* is a quarterly publication of the International Council on Mining and Metals (ICMM), a CEO-led organisation dedicated to sustainable development.

ICMM comprises many of the world's leading mining and metals companies as well as regional, national and commodity associations, all of which are committed to improving their sustainable development performance

and to the responsible production of the mineral and metal resources society needs. To receive future issues, and other updates on ICMM activities, please write to info@icmm.com

www.icmm.com



Good practices... Zero Waste Recycling of Metals Award-winning process yields no hazardous waste

Good Practices... showcases ICMM members' activities that exemplify innovative contributions to sustainable development. In this issue, we feature Umicore's battery recycling technology, which recently received the European Environmental Press Association's Gold Award 2004. Umicore is one of the world's principal producers of battery materials and a leading recycler of precious metals.

The vast majority of mobile devices, such as laptops, cell phones and palm pilots, are powered by lithium-ion rechargeable batteries, which are manufactured using nickel and cobalt as well as other metals and plastics. Recycling these products requires special processing and treatment to avoid generating hazardous waste materials or materials that may need to be put in landfills or disposed of. Prior to Umicore's involvement, an environmentally sound technology to recycle lithium-ion batteries did not exist, despite a clear need for it in a world increasingly using portable electronic equipment.

Umicore began a research and development programme for a new technology in 2002, and, by late 2003, the company completed a process called VAL'EAS® to meet this gap in recycling technology. VAL'EAS was designed to be flexible enough to handle different types of materials. This is important because an array of batteries collected for recycling is unlikely to ever contain a single type.

The technology uses the plastics contained in the batteries as fuel, burning it in a furnace to create extra heat. Metals are recovered as an alloy rich in cobalt, nickel, copper and iron. This

alloy is refined and separated into pure metal and metal compounds. No hazardous waste is generated due to a special gas cleaning system using plasma technology, which was developed to avoid the formation of dioxin or furan and capture all potential vapours of metals. A by-product of the process is used in the construction industry.

As the plastic from the batteries is used as fuel, the technology requires less external energy input than traditionally required for smelting metals. Scientists from Delft University of Technology in the Netherlands argue that it is much more eco-efficient to burn these small pieces of plastic than to try to separate plastics from metals in the batteries by pre-processing.

The recovered metals and metal compounds are re-used, often in a 'closed' recycling loop. For example, cobalt is re-transformed into cobalt dioxide in one of Umicore's Belgian plants. This is then sent to another Umicore plant in Korea to be converted into lithium cobaltite, which is used to make new lithium-ion batteries – and the cycle starts again.

“... The application is sustainable and contributes to a better use of resources. This is a prime example of eco-efficiency: added business value from the elimination of negative environmental impacts”

*Marc Van Sande
Executive Vice-President*

The VAL'EAS process will bring significant commercial benefits to Umicore as the demand for both recycling services and recycled material increases. Currently around 9,000 tonnes of cobalt are sold each year to make some 1.4 billion cells. As the world's leading supplier of cobalt compounds for rechargeable batteries, Umicore is well placed to supply recycled material, recovered using its award-winning process, for use in new rechargeable batteries.

The volume of batteries recycled is set to increase as equipment becomes obsolete and legislation, such as the European Commission's new recycling laws, increases the requirement for recycling. It is estimated that by 2010, Europe could be recycling nearly 2,500 tons of lithium-ion batteries per year.



Guy Ethier (right) and Daniel Cheret receive award on behalf of Umicore



Refined cobalt powder awaiting distribution

For more...

www.batteryrecycling.umicore.com/

Front and back cover photographs supplied by Umicore