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The International Copper Study Group co-hosted this year’s 2004 China International Copper Forum. Hosted by the China Non Ferrous Metals Industry Association and organized by Antaike, the Forum brought together industry (miners, processors and fabricators), associations, institutes and international organizations, exchanges, and other parties from China and the rest of the world. The conference focused on resources, technologies, markets, trade, processing and consumption.

ICSG’s Secretary General, Mr. Patrick Hurens participated as a conference co-chairman and as a speaker focusing on the subject of sustainable development.

Sustainable Development of the Copper Sector:  
A Global View

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Introduction

The International Copper Study Group is honoured to co-host the China Copper Conference. At a time when markets look towards the east for commercial sustainability, and in particular China, there is another agenda operating. This is an agenda which to a large extent has been imposed on the metals sector from the outside in view of addressing, assessing and even evaluating environmental, social and economic impact and contribution of the sector on society. Certainly industry has responded to the challenge. Today, I wish to share with you some views and perspectives of sustainable development as it affects the copper sector on a global basis.
Over the last decade the trend towards "globalization" has quickly transformed the traditional regional-based markets for copper products into a global market place where regional companies increasingly compete with large players and export-oriented economies. While globalization is generally associated with increasing, or in some cases limiting, access to markets, it also means a much higher level of scrutiny on markets and companies by regulators, financiers, the public and non-government organizations (NGOs).

Each stakeholder group has its own objectives, drivers, and agenda. On a global scale, a series of broad issues have emerged which in essence deal with the concept of sustainable development that originally dates back to the end of the seventies and the beginning of the eighties (e.g. Brundtland Report).

Governments are increasingly pressured to address these issues with a mixture of regulatory and voluntary measures. There is also trend towards internationalization of regulations under the auspices of intergovernmental organisations, agencies and multilateral treaties and conventions.

NGO’s, while traditionally mainly focused on other sectors, are starting to focus their attention on the minerals and metals sector. Local community based organizations and globally operating NGOs originally from the Northern Hemisphere, but increasingly so from Southern hemisphere countries and economies in transition are increasingly expressing their perspectives on the performance of the sector (often focusing on worst case examples). They intervene across various media and with different groups: directly with companies or indirectly through mass media or international events. More recently, there has been a shift in some of the strategies being used by some NGOs by either co-opting industry to work in partnership in addressing specific issues, or through market based instruments to influence changes.
Barely two years ago, world leaders came together in Johannesburg to hold the World Summit of Sustainable Development. The outcomes of this summit highlighted a couple of key issues for minerals and metals in general and copper in particular. For example, there has been a call for far greater corporate environmental and social responsibility by companies and industry sectors. This includes encouraging financial institutions to incorporate sustainable development (SD) considerations into their loan and credit management standards.

This issue alone can show how the NGO community can directly affect the ability of a company to access credit for a particular project or even perhaps group of projects. From the environmental point of view, the importance of reducing risks on health and the environment posed by some so-called heavy metals is of particular interest to this sector.

On the other hand, the WSSD also highlighted the need to increase access to safe drinking water and to increase energy efficiency. Other issues raised by the WSSD deal with the encouragement of more sustainable mining practices and limiting access to resources in internationally recognised environmentally sensitive environments. WSSD set a series of goals and targets which will have an impact on the copper sector. To what level remains to be seen but it will cut across a wide area of activities:

- Shift towards sustainable production and sustainable consumption
- Incorporation of SD considerations in decision making
- Access to water and energy
- Waste prevention, recycling and resource efficiency
- Chemical management and “hazardous” waste management, the use of precautionary principle and reversal in the burden of proof (where industry is required to prove that a product is safe to use) and the use of international instruments
- Transparency in payments to governments
- Programs of action to protect marine environment from land based pollutants
- Hot spot initiatives and other areas essential for biodiversity that can limit or significantly change exploration and exploitation activities.

Consequently, industry must cope not only with market pressures and competition (within the copper sector as well as with other materials) but also with an increase in public involvement and governmental actions.
In response to the emerging SD agenda and increasing stakeholder pressure in particular from environmental and social NGOs, the World Bank Group launched its Extractive Industries Review in 2000 to discuss the future role of the bank in the extractive industries with concerned stakeholders. The aim of this independent review was to produce a set of recommendations to help guide the World Bank Group’s involvement in the oil, gas and mining sectors. The discussion was within the context of the World Bank Group's overall mission of poverty reduction and the promotion of sustainable development. This global review was initiated in July 2001 and culminated with the EIR recommendations published in the Final Report on December 2003.

Over the summer of 2004, the World Bank Group management has formally responded to the recommendations. The proposed list of reforms for future lending projects includes a number of measures such as

- Introducing good governance indicators
- Seeking increased community support for projects
- Promoting renewable energy and energy efficiency initiatives
- Ensuring the project’s contribution to poverty alleviation
- Requiring disclosure of revenues from the projects.

Further recommendations coming out of the EIR review are in the process of being implemented. However, in some areas the WB Management Board disagreed with some of the more controversial, environmentally driven recommendations, such as in the case of the proposed phase out of financing of coal mine development – an issue of particular interest to China.
Measuring Performance: SD Indicator Sets

- Canada: NRCan - Minerals & Metals Indicator Initiative (MMI)
- USA: USGS & US Forest Service - Sustainable Minerals Roundtable (SMR)
- European Union: Raw Materials Supply Group - SD Indicators for the Non-Energy Extractive industry
- Global Reporting Initiative: Sectoral Supplement for Mining & Metals

One of the key challenges within the current SD agenda is the question of how to measure and assess performance in light of the complexity and variety of issues involved in metals extraction, processing and manufacturing. While reducing the complexity of systems to measurable criteria and, thus, enhancing clarity and transparency, SD indicators can be useful as analytical, explanatory, communication, planning and performance assessment tools.

On a national scale, a series of government or industry driven initiatives have been launched to develop SD indicators for the mining and metals sector. Important initiatives have been launched in Canada, the U.S. and the European Union, among others. All of these aim at demonstrating the sustainable development performance of the entire mining and metal sector in a given area.

For individual corporate reporting of mining and metal companies, the ongoing project of the Global Reporting Initiative (GRI) and the International Council for Mining and Metals (ICMM) to develop a sectoral supplement to the Global Reporting Initiative guidelines is of particular interest.

A draft of the Supplement has been available for public comment over the summer of 2004. The draft includes a series of mining specific indicators to illustrate, on the one hand, the social and economic contribution of mining and metals to sustainable development as well as, on the other hand, environmental performance measures. In addition, GRI has prepared an abridged version of the 2002 Sustainability Reporting Guidelines that integrates the draft Supplement to facilitate ease of use and illustrate how it fits in the context of the GRI reporting framework.
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ICSG and Sustainable Development

ICSG & Sustainable Development

• Directory of regulations and case studies on regulatory impacts
• Economic contribution of copper Sector in various regions (Europe, North America)
• Recycling efficiency & pilot studies on recycling performance
• Common Fund for Commodities Projects: Energy Efficiency, Impact of Mine Closures
• Survey of Corporate Environmental & Social Reporting Practice
• Copper Flow Model

The concept of sustainable development has always been a strong component of the mission of the International Copper Study Group (ICSG). Aiming at shedding more insight into sustainable development issues as these affect copper, the ICSG’s program includes:

– surveys of existing environmental and social reporting practice in the copper mining, smelting, refining and fabricating industry
– outlining the economic contribution of the copper sector to national economies
– developing recycling and copper flow models
– sponsoring commodity development projects on energy efficiency in China and India as well as the impact of mine closures on local communities
– developing a directory of regulations that affect copper products
– conducting various case studies, seminars and conferences on a wide range of topics (visit www.icsg.org for further information and list of publications).

ICSG Survey of Reporting Practice in the Copper Industry

• Scope: Mining, Smelting, Refining of Copper
• Internet-based survey
• Reports: Financial, EHS, Community Relations, Product Stewardship
• Reference years: 2000; 2003
• Nº of Companies surveyed: > 70 mining, refining; > 100 semis production
• Survey coverage (based on world capacities):
  > 85% of mining, smelting and refining
  > 70% of wire rod & brass mill production

Today, there is a growing expectation on the part of civil society, governments and, more recently, the financing sector for industry to report on various aspects of their business practice—the triple bottom line. In general, this is a sector that is poorly understood by the public and decision makers with NGO’s seen as more credible than CEOs. Access to timely,
reliable and accurate information is essential for public understanding and informed decision-making. In some countries, there already exist legal requirements or voluntary commitments addressing the disclosure of information in the context of shareholder or public-right-to-know regulations or sectoral codes of conducts. But in many cases, environmental and social reporting is a unilateral and voluntary approach of individual companies.

In theory, corporate reporting should enable stakeholders to understand and assess environmental and social performance of companies, while credibly demonstrating efforts, achievements, opportunities and challenges. In order to present a balanced view, it is necessary to assess, disclose and disseminate information regarding benefits, impacts and risks associated with processes and products throughout the mine and product life cycle, while respecting necessary commercial confidentiality.

The ICSG initiated a survey which focuses on public accessible reports. This limits some of the conclusions as there are many other forms of communicating results, however it does serve to highlight issues and changes. The first survey was conducted for the year 2000. Using this information as a baseline, the survey was repeated for the reference year 2003 to identify trends and achievements in global reporting practice.

Using country-specific capacity data from the ICSG Directory of Copper Mines and Plants and the ICSG Directory of Fabricators, we have found that the companies covered by these surveys account for over 85% of global mine, smelter and refinery production, and over 70% of global wire rod and brass mill production.

It is important to recognize that the survey only deals with reporting practice and does not address actual management practice. This means that non-reporting companies may as well have appropriate management programmes or other measures in place, but, as they currently do not report on these issues, these actions are not included in the survey.

I will only focus on some of the key results that demonstrate the current trends of reporting practice of companies operating in the copper sector. The full survey results are available from the ICSG Secretariat.

**Mining, Smelting, Refining**

**Trends in Corporate Policies:**

**Mining, Refining**

Regarding voluntary policies and commitments we found that across the industry there was:

- An increase in sustainable development approaches and thinking.
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- Increased emphasis on corporate governance issues (general business ethics, human rights issues and legal compliance)
- Increased focus on product-related issues and product life cycle thinking (green procurement, product stewardship, end-of-life management)
- Reporting on community relations, traditionally a “mining” issue, now being addressed by secondary & medium sized primary refiners

Trends in Report Availability: Mining, Refining

Major findings from the 2003 survey regarding reporting availability indicates that in comparison to the 2000 survey there was:
- Increased transparency across the board (+20% increase in reporting companies & coverage)
- “Sustainable development” reporting often in form of combined or stand-alone EHS and Community Relation reports (hence often avoiding the wording “SD report”)
- Policies and reporting on product stewardship issues emerging strongly, likely as a result of the increasing international attention being given to these issues by both industry institutions as well as by governments.

Fabrication:
In the last decade, stakeholder pressure was mostly focused on major mining and smelting operations due to the visible nature of impacts and benefits. Considering the size and structure of the downstream fabricating industry and the “invisibility” of many intermediate metal products in the final end use product, impacts and benefits of fabrication have not drawn stakeholder attention such as in the case of the upstream industry.

In the forthcoming years, it is likely that this may change. On the one hand, the introduction of technical, organisational and communication-oriented tools and measures have prevented or mitigated many obvious adverse impacts of mining and smelting activities. On the other hand, in the light of increased “life cycle thinking” particular emphasis will be placed in the future on issues regarding product design, use and recycling. The emerging concepts of sustainable development and product stewardship demand the collaboration of upstream and downstream companies.

Comparing the survey results for 2000 and 2003, it was recognized that the fabrication sector in general increased significantly its environmental and social reporting practices. However, the sectoral average is still far away from the “SD transparency” of many upstream operating companies. This is not surprising as the fabricating industry is more fragmented, less integrated and with few large players. Nevertheless, they are paying serious attention to these issues.

In particular, it could be shown that there was:
- Increased reporting on product-related issues (design, product stewardship, risk management)
- Increase of Environmental Management System Certification (ISO 14000) Increased adherence to or guidance from internationally recognised reporting guidelines (e.g. GRI)
- Emergence of long term community development issues (case studies, projects, initiatives)
- Emergence of reporting on dialogue with stakeholders and community relations

Following the stock-take of existing reporting practice, an analysis of scope, coverage and contents of reports has been carried out. In general, the issues addressed appear to be widely the same in the case of individual companies, but there has been notable increase in the use of indicators across the board. Many companies use these measures to demonstrate the current status of important issues and the achievements over time.
Besides “traditional”, straightforward indicators such as copper reserves, energy and raw material use, and emissions, a notable increase of more complex indicators has been identified to address the following issues:

- Breakdown of energy carriers and main material inputs (e.g. for calculating the Global Warming Potential)
- Land use and reclamation activities in mining
- Environmental management indicators (environmental expenditures)
- Social management indicators (“social” investment)
- Economic contribution to local community
Key Social/Product Issues (2003)

**Mining, Refining**

- Coverage companies
  - General Programme
  - Health & Safety
  - Community Relations
  - Stakeholder Dialogue
  - Hazards & Risks
  - Product Stewardship
  - Emergency/Compensation
  - Long-term Funds
  - Science & Research

**Fabrication**

- Coverage companies
  - General Programme
  - Health & Safety
  - Community Relations
  - Stakeholder Dialogue
  - Hazards & Risks
  - Product Stewardship
  - Emergency/Compensation
  - Long-term Funds
  - ISO 9001/9002
Copper and Sustainable Development

Copper: Essential, sustainable, recyclable, efficient

- 2002: Close to one third of the world’s population without access to electricity
- 2030: +2 billion people
- Rural → Urban: 1.1B
- GDP: 3% per year
- 2050: additional billion
  - Aging populations
  - South Asia, India: increase in productive population
- Significant infrastructure investments
  - Electricity
    - New
    - Renewable Sources
    - Energy Efficiency
  - Water

Companies operating in the copper sector are increasingly facing the challenges associated with sustainable development concepts and issues, such as stakeholder participation, stricter lending criteria, increased expectations regarding transparency, etc. But the SD agenda does not only pose challenges; it also provides the copper industry with a series of opportunities by exploiting the inherent natural and intrinsic properties of copper. Increased energy efficiency considerations and access to basic infrastructure requirements in many developing countries may open new market opportunities for copper. World development implies important challenges in terms of human needs. For example, it is widely recognized that access to basic services such as water and electricity must be of a high priority for any development policy. Most of the infrastructure required does not exist yet. These are solid markets for copper, unless others capture them first.

Recent reports from the World Bank and the International Energy Agency (IEA) address future shifts in demographic and energy trends which could affect copper demand. Consider what it would mean to copper demand to close the electricity deficiency gap. It is projected that there will be an accelerated transition from rural to urban patterns of living, with most growth occurring in developing countries, and that World GDP will increase threefold by 2050. According to the World Bank, the “demand for energy, water, housing and education will increase at incredible levels”.

Furthermore, given that poverty alleviation increases strongly the demand for materials and services, there will be a challenge to manage resources in a sustainable manner. However, copper’s properties as a natural, essential and recyclable material should ensure its place in meeting society’s needs. Its electrical and thermal properties make it a material of choice for energy efficient products, and for improving local infrastructure.
Whether these trends will result in an increase in demand for copper will depend on market conditions, technological trends, and regulations. But also on the efforts the industry puts in promoting and marketing its products on one hand and assessing the impact of regulations on the other.

In the past, world refined copper usage has been almost steadily increasing with an overall annual rate of 3.3% in the 20th century.

At the turn of the 20th century the global intensity of use was 0.3 kg/capita. By 1950 it increased fourfold to 1.2 kg/capita. The recent demand for copper has been fuelled by industrial growth and demand for copper intensive goods in mainly infrastructure and electrical uses. By end of 2003, the average per capita usage of copper for the world was 2.5 kg.

**Will there be enough copper to meet the future demand?**
this premise, there has been a lot of talk about the limits of growth and resource depletion due to what is often referred to “today’s unsustainable consumption patterns” (e.g. Club of Rome: “The Limits of Growth”).

So, will there be enough copper to supply future generations? I believe the answer to this question is a definite yes. Copper can be recycled without losing its material properties. So a lot of tomorrow’s copper usage will be derived from products and infrastructure in use today. However, longevity of many copper products, unavoidable process losses, not recoverable uses and the overall development of the world economy towards higher living standards imply the continued need for primary copper. Recycled copper is a compliment to primary copper. The rising demand for copper will continue to require primary metal from concentrates and SX/EW. So back to the question of can we meet these needs?

Let us look at the historical development of copper reserves and production. In 1950, the total estimated world copper reserves amounted to 91 million metric tonnes of copper (USGS). Over the period 1950-2004 (estimated for 2004), just under 400 million tonnes of copper was extracted around the world, or just about 4.4 times the total identified reserves of 1950! By 2004, the United States Geological Survey estimated world reserves at 475 million tonnes of copper. At the ICSG, our estimate for mine production for 2004 currently stands at 14.6 million tonnes. Here, world reserves refer to deposits containing copper that can be mined in an economically viable way according to the historical technological standards. Progress and innovation in technology, exploration activities and a series of other issues have increased the known reserves pool in such a way that they have far more than offset the amount of copper mined from reserves.

Current copper usage patterns

Over the last years, refined production has been relatively stable in Africa, Oceania, and Europe. In North America, a significant downturn occurred in recent years mainly driven by “voluntary” cutbacks in response to the adverse market conditions. Since then, markets have recovered with a sustained increase of production in Latin America and an even stronger increase in Asia.
The global picture of refined copper usage is very similar to the production patterns. Whereas in the traditional user areas Europe and North America copper usage has stagnated or even decreased, usage is growing quickly in Asia.

To no surprise, use of refined copper per capita is still much higher in advanced economies such as the US and Japan than in many developing countries or economies in transition. Yet in terms of usage per GDP, both Japan and the US show declining amounts, even if their actual usage has somewhat increased. This trend is not surprising if we consider that the service sectors have notably increased their contribution to GDP in these countries.

However, there are some significant shifts afoot, particularly in Asia. China’s intensity of use has grown in leaps, reaching 2000 kg per million USD of GDP. If this level of consumption continues, China’s need for copper would, by 2050 exceed the entire amount required by the world today (actually exceed 16 to 20 million tonnes of copper)
Currently, each additional 1 million USD of World GDP results in a need for half a tonne of copper. Over the last 10 years the rate of usage increased 40% (3.5% annually). Copper usage will continue to increase, fed primarily by continued Asian demand and particularly China as it invests in its infrastructure and Chinese become increasingly more demanding for comfort products (white goods, televisions, automobiles).

The world share of Chinese refined production and usage has been strongly increasing in the last decade. However, domestic refined production has not kept up with the large increase in refined usage in the last years. As a result, China is now the world’s largest user of refined copper (est. 3.3 million tonnes of copper for 2004) and its largest importer (1.4 million tonnes refined copper in 2003 with over 900 thousand tonnes gross weight of copper scrap exported to China in 2002, one third of total exports of scrap).

Where will the future Chinese demand come from? Will it derive from substitution of manufacturing in mature economies or will it be backed by an increased domestic demand due to wealth generation? Is the Chinese demand sustainable - driven by a continued demand from its rapid industrialisation? Or is it just a temporary boost from some large-scale and long-term infrastructure investments? What will be the overall effect on copper demand? And what
about the current SD agenda? How will it affect the current and future copper markets in China?

These are key questions that will affect the overall sustainability of the copper sector and on which the ICSG will focus its attention in the coming year.

Relevance of SD Debate for China's Copper Sector

• Stakeholder pressure:
  – “Social License” to operate
  – Material choice: Product design & “Green Procurement”
  – Transparency of revenues, processes, impacts

• Policies, regulations, standards ...
  – Access to resources (primary/secondary)
  – Environmental technology & management standards
  – Product focus: Risk management, product stewardship & precautionary principle

All countries, including China, will, and in fact are being affected by the issue of sustainable development and the debate that surrounds it. No one is insulated. Key issues likely to affect economies in transition will be:

  – Increased stakeholder pressure:
    o “Social License” to operate
    o Material choice: Product design & “Green Procurement”
    o Transparency of revenues, processes, impact on operations
  – Increased policies, regulations, standards:
    o Access to resources (primary/secondary)
    o Market access issues (particularly in context of China’s accession to the World Trade Organization)
    o Environmental technology & management standards
    o Product focus: Risk management, product stewardship & precautionary principle

Sustainable development offers both challenges and opportunities to the copper sector. What is important is how these issues are managed and the partnerships established in addressing them.