LEAD AND ZINC FORECAST

The outlook for World supply and demand for lead and zinc was presented during the ILZSG meeting held in Lisbon on 27 April 2016. Highlights include:

- ILZSG anticipates that **global demand for refined lead metal** will rise by 2% to 10.83 million tonnes in 2016. In China, increased usage in the automotive and telecommunications sectors will be partially balanced by a reduction in demand in the e-bike market resulting from slower sales growth and competition from lithium-ion batteries. European demand is forecast to grow by 3.5% mainly due to anticipated rises in the Czech Republic, Italy, Spain and the United Kingdom. After falling by 5.2% in 2015, a partial 1% recovery is anticipated in the United States.
- **Global lead mine output** is predicted to increase by 0.5% to 4.58 million tonnes mainly as a consequence of a 9.7% rise in China. An expected fall of 6.1% in ex-China production will be primarily due to reductions in Australia with the closure of MMG’s Century mine last year and cutbacks announced by Glencore, CBH Resources and Perilya.
- An anticipated 2.3% rise in **global refined lead metal production** to 10.90 million tonnes will be principally influenced by increased output in China and the Republic of Korea where Korea Zinc recently commissioned a new 130,000 tonne per year capacity lead plant in Ulsan.
- Based on the latest information ILZSG anticipates a **global refined lead metal surplus of 76,000 tonnes in 2016**.

- **World usage of refined zinc metal** is expected to increase by 3.5% to 14.33 million tonnes in 2016. This rise will be primarily driven by a 4.5% increase in China where demand is expected to benefit from continued infrastructure investment. After rising by 3.2% in 2015, usage in Europe is expected to remain stable in 2016. Strong growth of 13.1% is anticipated in the Republic of Korea. Increases are also forecast in India (4.1%), Japan (4.2%) and the United States (3.1%).
- Overall global **zinc mine output** is expected to fall by 1.4% to 13.27 million tonnes. A forecast sharp fall in ex-China zinc mine production of 9.4% is due to a combination of mine closures and recently announced production cutbacks. Chinese output, which is reliant on production from a large number of small mines, is forecast to grow by 12.4%.
- **Global refined zinc metal production** is predicted to increase by 0.5% to 13.98 million tonnes in 2016 with a forecast 4% increase in China being largely balanced by an ex-China reduction of 2.3%.
- Information recently collected from ILZSG member countries indicates that global demand for refined zinc metal will exceed supply by 352kt in 2016. This deficit is higher than that indicated by the Group during its meetings last October with the difference due primarily to additional cutbacks in mine production announced over the past six months.

For further details of the outcomes of the ILZSG meetings or questions on the market outlook please email Paul White at paul_white@ilzsg.org

NEXT STUDY GROUPS’ MEETINGS

The dates for the next International Study Groups’ meetings are:

- INSG: 24 - 26 Oct. 2016, Lisbon, Portugal

Joint Study Groups’ Seminar 2:00pm to 5:30pm on 26 October 2016: “Social Acceptance of the Mining and Metals Industry” Lisbon, Portugal


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COPPER FORECAST

The International Copper Study Group (ICSG) met on 9-10 March 2016 in Lisbon and reviewed the current outlook and trends in World copper supply and demand. The following forecast was issued:

- In developing its global market balance, ICSG uses an apparent demand calculation for China, the leading global consumer of copper, accounting for about 45% of world demand. Apparent copper demand for China is based only on reported data (production + net trade +/- SHFE stock changes) and does not take into account changes in unreported stocks [State Reserve Bureau (SRB), producer, consumer and merchant/trader], which can be significant during periods of stocking or de-stocking and which can markedly alter global supply-demand balances.

- According to ICSG projections, the copper market is expected to remain essentially balanced in 2016 and 2017. This compares with a small deficit of 127,000 t and a surplus of 175,000 t for 2016 and 2017, respectively, forecast at our October 2015 meeting. Downward revisions have been made for both production and usage in view of global weaker economic outlook, and project delays and price related production cuts.

- World mine production after adjusting for historical disruption factors is expected to increase by around 1.5% in 2016 (lower than the 3.5% growth in 2015) to reach 19.4 Mt (million tonnes). While concentrate production is expected to grow by 4%, growth will be partially offset by a decline in SX-EW production due to price related production cuts in the Democratic Republic of Congo and closures in Chile. Higher global mine production growth of around 2.3% is expected in 2017 as additional supply is expected to arise from expansions at existing operations, ramp-up in production from mines that have recently come on stream and output from a few new mine projects.

- After increasing by around 1.6% in 2015, world refined copper production in 2016 is expected to increase by only 0.5% to 23 Mt. Although primary refined production (excluding SX-EW) is expected to grow by of around 3%, growth will be partially offset by an anticipated decline of 1% in secondary production (from scrap) and a decline of 8% in SX-EW output. For 2017, world refined production is expected to grow by 2% benefiting from a growth of around 7% in SX-EW output. China will be biggest contributor to world growth in both years.

- ICSG expects world apparent refined usage in 2016 to remain essentially flat. This is mainly because apparent demand in China is expected to be basically flat (+0.5%), although underlying “real” demand growth in China is estimated by others at around 3-4%. Usage in the rest of the world in 2016 is expected to remain practically unchanged. For 2017, the growth in world apparent refined usage is expected at around 1.8% with underlying Chinese industrial demand growth expected at around 3%, while usage in the rest of the world is expected to increase by about 1%.

In developing its projections, ICSG recognizes that global market balances can vary from those projected owing to numerous factors that could alter projections for both production and usage. In this context it can be noted that actual market balance outcomes have on recent occasions deviated significantly from ICSG market balance forecasts due to unforeseen developments.

For further details of the outcomes of the ICSG meetings or questions on the market outlook please e-mail ICSG Director of Market Research and Statistics Ana Rebelo at rebelo@icsg.org.
• INSG members also discussed market trends. Nickel pig iron (NPI) production in China continued to decline in 2015 due to the low nickel price and the effect of the Indonesian ban on nickel ore exports implemented in January 2014. A further decline is expected this year due to lower level of availability of nickel ore from the Philippines. In Indonesia, NPI production will continue to increase in 2016 due to the ramp up of new projects.

INSG recognizes the significant impact of the current financial, economic and political uncertainty in many parts of the world. The effects on both the supply and demand for nickel are not fully known. The Study Group cautions that future market developments could alter the forward-looking market balance.

For further details of the outcomes of the INSG meetings or questions on the market outlook please email Salvatore Pinizzotto at s.pinizotto@insg.org

JOINT INSG/ILZSG SEMINAR

A Joint INSG/ILZSG Seminar, “Innovative Technology in Mining and Metals” was held on 27 April 2016 in Lisbon, Portugal. The seminar was a joint initiative of the International Lead and Zinc Study Group (ILZSG) and the International Nickel Study Group (INSG). The seminar was chaired by Mr. Ugo Miretti of the European Commission.

The Seminar opened with a keynote address by Professor Jan Cilliers, FREng. Head of the Department of Earth Science and Engineering at Imperial College, London. His presentation covered two topics in particular: innovative applications of sensors and new advances in grade engineering. Dr. Chris Broadbent of Wardell-Armstrong consultants made a presentation entitled “Flexible and Mobile Processing Technologies: Accessing European Ores” in which he provided an overview of the EU FAME Program and also gave a detailed commentary on research conducted at a fluorspar mine in England under this program. This was followed by a presentation by Dr Norbert Malesschitz, Vice President for R&D at Exide Technologies, on the latest developments in the use of lead-acid batteries in micro-hybrid and hybrid vehicles. Mr Marko Lahtinen, Senior Sales Manager for Zinc Technology at Outotec, then spoke on “Latest Development in Outotec Zinc Production Technology”. His presentation covered trends and challenges in zinc production as well as Outotec process and equipment solutions. This was followed by Mr Janne Palosaari, Chief Commercial Officer at Terrafame whose presentation on “The Production Ramp-Up at Terrafame’s Nickel and Zinc Mine Applying Novel Bioheapleaching Technology” provided details on the Sotkamo mine, one of the largest known nickel sulphide deposits in Europe. Next, Prof. David Dreisinger of InCor Technologies Limited (Canada) gave a presentation entitled “Starved Acid Leach Technology (SALT) Applied to Nickel Ores from Indonesia, Australia, New Caledonia, Brazil” in which he provided details on innovative technology to treat nickel ores. The final presentation was by Mr. Bill Bihlman, President of Aerolytics LLC, entitled “Aeroengine Materials: Current and Next Generation" looking at additive manufacturing, engine design and materials selection.

Following each presentation, the Chairman invited questions from the audience. The presentations, questions and discussions aided all participants to better understand the opportunities that are being created by innovation. The Chairman underlined the importance of holding events such as the current seminar and affirmed that the Study Groups would continue to develop joint seminars focused on specific important non-ferrous metals producing and using countries and regions.

Delegates from INSG member countries, industry and observing countries/organisations met in Lisbon on 25-26 April for the 26th INSG Session to review statistical, economic and environmental issues related to nickel.

Delegates reviewed the INSG primary nickel market statistics in detail, and discussed the market forecast, which was prepared by the secretariat based on information provided by governments and industry. Details of the forecasts are provided on page 2.

The INSG Environmental and Economics Committee received presentations on topics related to environmental regulation and international policy initiatives that may affect nickel. Mr. Gianclaudio Torlizzi, Managing Director, T-Commodity, Italy, made a presentation on “Insights into the Nickel Market”. Dr. Nia Bell, Technical Consultant, Oakdene Hollins, United Kingdom, made a presentation on the work done on the by-product metals study for the Study Groups. Mr. Marco Vallini, Public Policy
Specialist, Nickel Institute, made a presentation on “Regulatory Update on Nickel and Ni Compounds”.

The INSG Statistics Committee reviewed the latest statistical data, and also received valuable input to its work through a series of presentations and discussions. Mr. Kai Hasenclever, Director, Economics & Statistics and Long Products, ISSF, Belgium, made a presentation on “The Current Situation on the Global Stainless Steel Market”. Mr. Benno Kratz, Managing Director, ELG Haniel Trading, Germany, spoke on the latest world trends in the supply and demand for stainless steel scrap from the point of view of a large processor.

The INSG Industry Advisory Panel comprised of representatives from the world’s nickel producing, using and recycling industries, once again provided valuable input on the Study Group’s work program priorities. Mr. Sean Mulshaw, Senior Nickel Analyst, Wood Mackenzie, United Kingdom made a presentation on “Nickel: Stock Decline and Production Cuts – the key for higher prices”. Mr. Joseph Pickard, Chief Economist and Director of Commodities, Institute of Scrap Recycling Industries Inc. (ISRI), United States, made a presentation on “Drivers, Trends and Outlook for the U.S. Stainless Steel and Scrap Industries”. Mr. Michael Dixon, Director EMEA & Americas, AME Group, United Kingdom, made a presentation on “Nickel Supply – A Critical Future: Technology and Geology”.

The International Lead and Zinc Study Group held its latest meeting in Lisbon on 27 April 2016. The Director of Statistics and Forecasting presented a review of the current outlook for World supply and demand (See details on page 1). Meetings of the Standing Committee, Economic and Environment Committee and the ILZSG Industry Advisory Panel were held.

The Industry Advisory Panel meeting on 27 April provided an opportunity for an exchange of information between members and industry on the latest developments in the lead and zinc market. A presentation was made on “The Outlook for the Italian Lead and Zinc Sector” by Dr. Cinzia Vezzosi, President of Assofermet, Nonferrous Metals Division of Italy. This was followed by a presentation on “Revisiting Strategy in the Mining Sector” by Mr. Mike Barden, Chief Executive Officer, Commodity and Mining Insight Limited, UK.

The Study Group’s Economic and Environment Committee met on 27 April. The Committee heard from Dr. Steve Binks, Regulatory Affairs Director, International Lead Association, who provided an excellent overview of the latest regulatory developments affecting lead in a presentation entitled “Key Issues Currently Impacting the Lead Industry”. This was followed by a presentation by Dr. Christine Spirlet, IZA Manager for Regulatory Affairs, entitled “Zinc Oxide in Today’s World: Trends and Regulations” in which she reviewed key regulatory issues for zinc globally. Dr. Nia Bell of Oakdene Hollins then gave a presentation on the recently-completed study of the By-Products of Lead, Zinc, Copper and Nickel. The research covered 17 metals that are produced as by-products of the four principal Study Group metals and was done as part of a joint project of the three Study Groups.

**ILZSG 27 APRIL 2016 MEETING**

As part of the April INSG meetings a special seminar was held on the role of China and South-east Asian countries in the current and future development of the nickel market. Several outstanding and knowledgeable speakers provided their insights on the Asian region. Prof. Luis Mah, Department of Economics, ISEG – Lisbon School of Economics & Management, Universidade de Lisboa, Portugal, made a presentation on “A New Asian Economic Order?” Ms. Xu Aidong, Chief Analyst Nickel, Beijing Antaike Information Development Co. Ltd., China P.R. presented on “Nickel Production in Southeast Asia: Trends and Perspectives”. Mr. Sunindyo Suryo Herdadi and Mr. Syamsu Daliendi, senior officials from the Ministry of Energy and Mineral Resources, Republic of Indonesia, gave a presentation on “Mineral Added Value Policy in Indonesia”. Mr. Michael S. Carl, International Legal Advisory, SSEK, Republic of Indonesia made a presentation on “Nickel Resource Situation and Investment Environment in Indonesia”. Mr. Koichi Ishihara, Vice President for Marketing & Procurement, Nickel Asia Corporation (NAC), Philippines, gave a presentation on “Historical and future nickel ore export from the Philippines”. Mr. Oliver Spaltmann, Senior Market Analyst, SMR GmbH, Austria, spoke on “China – A Ticking Time Bomb? Implications for Stainless Steel and Nickel”.

**INSG SEMINAR - NICKEL IN SOUTH-EAST ASIA AND CHINA**

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Mr Carlos Risopatron, ICSG Director of Economics & Environment, presented the latest ICSG work on fabrication output and capacity, the 2016 edition of the Annual Recyclables Survey, and trends in the trade of scrap and other copper raw materials. He presented new data showing world industrial use of copper growing over 28 Mt-Cu in 2015. With a global use of recycled copper below 8 Mt-Cu in 2014 and around 7.7 Mt-Cu in 2015, the ICSG survey found that use of recycled copper fell to 28% of world copper use in 2015. The global survey reported less scrap refined and less scrap directly melted in fabrication in recent years.

Dr Luis Tercero, Coordinator, Business Unit Systemic Risks, Fraunhofer ISI, presented maps of inter-regional trade flows for copper raw materials, semis and manufactured products undertaken in conjunction with the International Copper Association. Mr Carlos Risopatron, ICSG Director of Economics & Environment, presented developments in relation to the regulation of marine transport of ores and concentrates and regulations affecting conflict minerals that might impact some copper by-products such as gold.

Dr Jaco Huisman, United Nations University (UNU) delivered a presentation on global copper flows from e-waste based on copper content in electric and electronic waste statistics. Dr Huisman is part of UNU Sustainable Cycle Program that provided policy advice for the Review of the EU WEEE Directive and for the e-waste quantification studies such as the Global E-waste Monitor (2014), the EU Countering WEEE Illegal Trade project and the ongoing ProSUM

Mr Shairaz Ahmed, ICSG Manager of Statistical Analysis, introduced the latest Directory of Copper Mines and Plants published in January 2016. The Directory updated the main developments for over 1,000 existing and planned copper mines, smelters and refinery capacities up to 2019. Detailed information is available in the ICSG the Directory of Copper Mines and Plants.

Mr Tim Biggs, UK Sector Leader, Metals and Mining, Deloitte LLP, presented a list of key issues facing the mining and metals industry in 2016. He suggested at the outset that miners cannot become complacent about cost control as they face such difficult issues as labour relations, energy efficiency, innovation, supply chain optimisation, data integration and back office restructuring. On the demand side he identified urbanisation, industrialisation and infrastructure development as the driving forces that, combined with inevitable supply shortages, will ultimately send prices back up. He concluded by emphasising that through understanding the trends copper miners can maximise their returns through this difficult period.

Mr Caesimo Tambwe, CTCPM Deputy Coordinator, Ministry of Mines Democratic Republic of Congo (DRC), presented the recent history of copper mining in the DRC and the main challenges for an optimal and sustainable development of DRC copper mining. He presented new information on mineral occurrences, geological maps and the major commodities available in DRC reserves.

The 24th General Session of the International Copper Study Group was held in Lisbon, Portugal on Wednesday 9 March and Thursday 10 March 2016, in conjunction with the Metal Bulletin International Copper Conference held at the Sana Lisboa Hotel from Monday 7 March to Wednesday 9 March 2016.

On the 9-10 March 2016 representatives from ICSG member governments and industry, observer governments and organizations attended the ICSG Joint Statistical Committee/Environmental and Economic Committee/Industry Advisory Panel.

Ms Ana Rebelo, ICSG Director of Market Research and Statistics, presented an overview of the market in 2015 highlighting how the impact of low copper prices was mitigated by other factors and how the price-related mine closures/production cuts were more than offset by growth at other mines. She also presented the ICSG forecast for 2016 and 2017 (see page 2 above)

Dr Zhang Fang, Senior Analyst, and Dr. Yang Changhua, Chief Copper Analyst, Antaike China, delivered a detailed presentation on the supply, demand and trade flows of copper in China, including a market balance for the country. Dr Zheng concluded by saying that the growth in refined copper production will gradually slow down and that the growth in refined usage will also slow down but China will remain the main contributor to global copper usage.

Mr Dieudonne-Louis Tambwe, CTCPM Deputy Coordinator, Ministry of Mines Democratic Republic of Congo (DRC), presented the recent history of copper mining in the DRC and the main challenges for an optimal and sustainable development of DRC copper mining. He presented new information on
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Mr Carlos Risopatron, ICSG Director of Economics & Environment, presented some copper related outcomes of the 2015 Update Study of By-Products of Lead, Zinc, Copper and Nickel undertaken as a joint project for the three Study Groups by the consulting firm Oakdene Hollins. The high-level report on the production, use and trade of by-product metals includes a directory of by-product metal producers and historical market balances for individual metals. The By-Products report is available for sale.

ICSG TEAM ATTENDS IWCC SESSION IN SOUTH AFRICA

ICSG Secretary General and the Director of Statistics attended the 2016 session of the International Wrought Copper Council (IWCC) in South Africa in May 2016. Most recent changes in the regional use and production of refined copper were discussed in the session with representatives of fabricators of copper and copper alloy products from different regions of the world.

ICSG ATTENDS AMERICAN COPPER COUNCIL EVENT IN THE UNITED STATES

In May 2016 the ICSG Director of Economics and Environment represented the Study Group at the American Copper Council Copper College in Tucson, Arizona, US. This is a major annual US copper industry event. He delivered a detailed presentation on Mexico’s copper value chain from mine capacity to mine production, scrap trade, copper smelting, refining and fabrication. He also visited the Mission copper mine and copper concentration plant. The ICSG presentation can be requested from: risopatron@icsg.org.

ICSG ATTENDS INTERNATIONAL METAL CONFERENCE IN IRAN

In November 2015 the ICSG Director of Economics and Environment represented the Study Group at the Iran Metal Conference in Tehran and made a presentation on the global copper industry. The ICSG presentation can be requested from: risopatron@icsg.org.

ICSG ATTENDS CRU COPPER WIRE AND CABLE CONFERENCE IN ITALY

In June 2016 the ICSG Director of Economics represented the Study Group at CRU Wire and Cable conference in Milan, Italy. He made a presentation on current global trends and perspectives for the copper market. The ICSG presentation can be requested from: risopatron@icsg.org.

ICSG TO PARTICIPATE IN TONGLING INTERNATIONAL COPPER FORUM

ICSG will participate in the 2nd China International Copper Forum to be held in Tongling, China, in September. Tongling hosts one of the most important centers of use of refined copper and scrap in China. ICSG will contribute to the event with a detailed presentation on the global recycled copper market situation and perspectives.

ICSG SURVEY ON FABRICATION IN THE AMERICAS EX USA IS ADVANCING

In order to expand the limited knowledge on industrial use of refined copper and scrap, in 2015 ICSG launched a survey of copper and alloy fabrication plants located in the Americas excluding the United States. The study covers all fabrication plants in South America, Mexico and Canada. The survey is advancing and a final report is expected to be delivered to ICSG members in October 2016.

ICSG TO START NEW STUDY IN CHINA ON INDUSTRIAL COPPER USE IN FABRICATORS

The study, approved in March 2016 will include a database update of fabrication capacity, a survey of copper use in China’s fabrication industry, and a Chinese market study of wire rod, copper semis and brass mill products. A final report is expected to be complete in April 2017.

ILZSG PRESENTS AT METAL BULLETIN’S 8th WORLD LEAD CONFERENCE

Paul White, ILZSG’s Director of Market Research and Statistics, was invited to make the opening presentation at Metal Bulletin’s 8th World Lead Conference that was held in Amsterdam from 29 to 31 March 2016. The paper entitled “Analysing the Global Lead Market – Key Opportunities and Challenges” assessed issues impacting current and likely future trends in lead mine and metal output and metal demand. To obtain a copy of the PowerPoint
THE IMPACT OF RECENT MINE CLOSURES AND CUTBACKS ON GLOBAL ZINC SUPPLY

A paper examining the implications of the closures of the Century and Lisheen mines as well as a number of other recently announced cutbacks was presented by Paul White, the ILZSG Director of Market Research and Statistics, at Metal Bulletin’s 20th Zinc and its Markets Seminar held in Madrid from 9 to 11 May 2016. The paper also discussed the outlook for refined zinc metal output and the Group’s latest global supply and demand forecasts. Copies are available from the secretariat at paul_white@ilzsg.org.

STAINLESS STEEL WORLD MAGAZINE PUBLISHES INSG ARTICLES

INSG staff once again collaborated in writing articles for important industry publications. Two INSG articles have recently been written for Stainless Steel World Magazine. The first, in November 2015, focused on changes in nickel production capacities based on the INSG Nickel Forecast. The second article published in June 2016, looks at nickel market developments and was entitled “INSG: Slow Growth in Global Economy Hits the Nickel Market”. Copies of the articles are available from the INSG secretariat.

INSG PAPER PRESENTED AT 29th ANNUAL STAINLESS STEEL AND ITS ALLOYS CONFERENCE

In October 2015 the INSG Director of Market Research and Statistics represented the Study Group at the 29th Annual Stainless Steel and Its Alloys Conference organized by the American Metal Market and SMR in Chicago, U.S., from 27 to 28 October 2015. Anyone interested in receiving a copy of this paper should contact the secretariat at s.pinizzotto@insg.org.

INSG ATTENDS THE 13th SHANGHAI DERIVATIVES MARKET FORUM

Mr Salvatore Pinizzotto, INSG Director of Market Research and Statistics represented the Study Group at the 13th Shanghai Derivatives Market Forum held in Shanghai, China P.R. on 25-26 May 2016 organised by the Shanghai Futures Exchange (SHFE). He gave a presentation on “World Nickel Market: Trends and Perspectives”. The presentation is available from the secretariat. Please contact: s.pinizzotto@insg.org

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INSG AT BIR – WORLD RECYCLING CONVENTION AND EXHIBITION

Mr Salvatore Pinizzotto, INSG Director of Market Research and Statistics gave a keynote speech Group at the World Recycling Convention and Exhibition held in Berlin, Germany, on 30 May-1 June organised by the Bureau of International Recycling (BIR). The presentation is available from the secretariat. Please contact: s.pinizzotto@insg.org

This edition of Metal Despatch features images of nano forms of the Study Group metals.
MEETINGS, CONFERENCES and SEMINARS

On 21-23 September 2016, China Non Ferrous Metal fabrication Association (CNFA) and Tongling Municipal Government will host the 2nd Tongling International Copper Forum. There are more than 60 fabricators of copper products in the region. ICSG Director of Economics and Environment will present the global copper scrap market analysis in the event. To attend the event please contact copper@lilanconsulting.com

On 18-20 October 2016 China CNIA and Antaike will host the annual Chinese International Copper Conference in the city of Hefei, Anhui, China. ICSG will provide support for the event with a presentation on the Copper Market Outlook to be delivered by the ICSG Manager of Statistical Analysis.

The China Nonferrous Metals Forum, will be held on 1 November 2016 in London, hosted by China Nonferrous Metals Industry Association (CNIA)

The China International Nickel and Cobalt Industry Forum 2016 will be held on 9-11 November 2016 in Wuzhen, China, Zhejiang hosted by China Nonferrous Metals Industry Association (CNIA) and organised by Antaike.

Asia Copper Week 2016, including the CESCO Asia Copper Dinner, will be held in Shanghai on 15-17 November. ICSG will be represented by the Secretary-General. http://www.asiacopperweek.com/

China CNIA and ANTAIKE will host the annual China International Lead & Zinc Conference in Chengdu, Sichuan, China, 14-17 November 2016.

The Indian Lead and Zinc Development Association will hold a Lead and Zinc Battery Conference in New Delhi, India on 14-15 November 2016.
JOINT PROJECTS CONDUCTED BY THE STUDY GROUPS

The co-location of the three Study Groups in Lisbon enhances their ability to conduct joint projects. Highlighted here are some of the joint projects which are underway or have been completed recently.

NEW PROJECTS

SOCIAL ACCEPTANCE FOR MINERAL AND METAL PROJECTS
This joint study was approved by each of the Study Groups in April 2015 and the contract was awarded to a team from the University of Queensland. A preliminary report on the study will be made at the October 2016 Study Group meetings and the final report is expected to be released by December 2016.

UPDATE OF THE REPORT ON BY-PRODUCT METALS OF COPPER, LEAD, ZINC AND NICKEL
This joint report and directory updates and builds on the 2012 report on the same topic and provides information on the by-product metals of copper, zinc, lead and nickel. Updated information is included on bismuth, germanium, indium, cobalt, platinum group metals, scandium, molybdenum, rhenium, selenium, tellurium and rare earth elements. In addition, this new report adds coverage of gallium, cadmium, gold, silver, arsenic and mercury. The work was carried out by Oakdene Hollins of the UK under a contract for the three Study Groups and the report was published in December 2015.

COMPLETED PROJECTS

COBALT AS A BY-PRODUCT OF COPPER AND NICKEL
This joint report of the International Nickel Study Group and the International Copper Study Group provides improved information on cobalt, and the relationship between nickel, copper and cobalt production, refining and use. The work was carried out by Roskill Consulting Group on behalf of the Study Groups and is intended to be a reference document for governments and companies.

NON FERROUS METALS BY-PRODUCTS: JOINT STUDY GROUPS’ RESEARCH PROJECT
A project by the three Study Groups to generate information on the by-product metals of copper, lead, zinc and nickel was initiated by member countries at the September 2012 meetings. A contractor was selected to gather information on production, usage, trade and other data, on by-product metals. The project resulted in the completion of a 221 page Study of By-Products of Copper, Lead, Zinc and Nickel as well as a Directory of Producers. These publications have been distributed to member countries. A Joint Seminar on by-product metals was held in October 2013. In early 2014 separate publications were issued for each of the metals in the original study: bismuth, indium, germanium, scandium, cobalt, rhenium, tellurium, selenium, rare earths and molybdenum.

JOINT STUDY ON TAXATION AND FISCAL INCENTIVES
This joint project was approved by each of the Study Groups in October 2012 and a contract was awarded to RMG of Sweden to conduct the study. A preliminary report on the project was presented at the April 2013 Joint Seminar in Lisbon. A copy of this presentation is available on the ILZSG website. The final report of the project was published in December 2013.

JOINT STUDY ON RISK FACTORS
The Study Groups jointly collaborated on a project to examine the main risk factors likely to inhibit companies’ ability to meet production targets or to develop planned mining and metals projects. A presentation on the study was made at the October 2013 meetings and the full report was published in January 2014.

Study Groups Publications from Joint Projects
- Study Groups’ Survey of Semifabricators in China
- By-Products of Copper, Zinc, Lead and Nickel
- Joint Study On Risk Factors
- Joint Study On Taxation And Fiscal Incentives
- Cobalt As A By-Product Of Copper And Nickel
PUBLICATIONS

*******AVAILABLE NOW********

NEW – Continuously Updated!
Lead and Zinc Mine and Smelter Database
An interactive interface on the ILZSG website provides access to the comprehensive records contained in the extensive ILZSG mine and smelter databases. Information on operating mines and smelters with contact details, capacities and location. Listings of both currently committed and under consideration mine and smelter projects are provided as are details of all mine and smelter openings and closures back to 2000. Information can be filtered by country and date and downloaded in various formats including Excel. Continuously updated.

NEW – Continuously Updated!
ICSG Online Statistical Database
The ICSG maintains one of the world's most complete historical and current databases with statistics on copper production capacities (trend in operational and developing/planned copper mines, smelters and refineries), statistics on copper mine, smelter and refined production, copper refined usage, stocks, prices, recycling and trade for copper products. Continuously updated.

INSG World Directory of Nickel Production Facilities 2016
Comprehensive directory lists nickel mines, smelters and refineries as well as new nickel industry developments (committed, likely and potential) together with recent closures in more than twenty countries. Published July 2016.

NEW
Lead and Zinc New Mine and Smelter Projects 2016
This 68 page report covers lead and zinc mines and smelters opened or closed during 2015, firm projects currently committed and other projects under consideration. Developments in 44 countries spread throughout all the continents are covered with a total of over 200 separate entries. In addition, where available, estimates of ore reserves and the percentages of the metals they contain are also given. Published January 2016

Nickel Production in South-East Asia : Trends and Perspectives
This publication was commissioned by INSG and carried out by Beijing Antaike Information Development Co. and provides a comprehensive overview of primary nickel production in South-East Asia. Mainly focused on nickel production in Indonesia, the Philippines, Myanmar, Papua New Guinea and Vietnam the report describes nickel reserves and mine production along with new developments in primary nickel production in the period of 2015-2020. Additionally, the study summarizes the main key issues of Nickel Pig Iron (NPI) production in China and Indonesia. Published April 2016.
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NEW

Directory of Copper Mines and Plants
The Directory highlights current capacity and provides a five year forecast of capacity for over 1,000 existing and planned copper mines, smelters and refineries on a country by country basis, with separate tables for SX-EW plants. Details for each operation are included and the Directory separates operations between Operating & Developing and Exploration & Feasibility stages. Published January 2016.

NEW

By-Products of Lead, Zinc, Copper and Nickel
A joint report of the three Study Groups on the production, usage, trade and outlook for 17 by-product metals. Information on sources of by-product metals, refinery processes, recycling, markets, contracts, and pricing, uses, government regulations, REACH status, government stockpiles and trade restrictions is provided. Historic market balances for many metals are provided. Includes a directory of mining and producing companies. Metals covered are arsenic, bismuth, cadmium, cobalt, gallium, germanium, gold, indium, mercury, molybdenum, platinum group metals, scandium, silver, rhenium, selenium, tellurium and rare earths. 338 pages. Published December 2015.

NEW

World Directory: Lead and Zinc Mines
Comprehensive 72 page report covering mines located in 43 countries. Includes information on ownership, type of mine and start-up date, full contact details. Also provides data regarding annual production capacities for lead and zinc. Extensive coverage of mines located in China. Updated March 2016.

NEW

World Directory: Primary and Secondary Lead Plants
An overview and full detailed listing of over 270 primary and secondary lead smelters and refineries in 66 countries showing addresses, telephone and fax nos., e-mail, web addresses, types of plant operated and current capacities. Also includes, summary tables and graphs. 105 pages. Updated March 2016.

ICSG 2015 Statistical Yearbook
The yearbook includes annual statistics on copper and copper products, their production, usage and trade by country, as well as stocks and exchange prices, providing a global view of supply and demand for the past 10 years. The Yearbook serves as a useful tool for consultations and analysis on the longer term evolution of world copper production, usage, stocks and prices. Published October 2015

China Primary and Secondary Zinc Metal and Zinc Oxide Sectors
Prepared for the ILZSG by the BGRIMM Lilan Consulting Corp. Ltd, this report provides a comprehensive assessment of the production of both primary and secondary zinc in China including discussion of processes employed and raw material used. The report also provides and in depth overview of the Chinese zinc oxide sector. Much of the data has been sourced directly from zinc producers, consumers and traders. 44 pages. Published December 2015.
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2015 Directory of Copper & Copper Alloy Fabricators (First Use)
This directory provides a systematic global overview of companies and plants involved in the first use of copper. First users are mainly semis fabricators that process refinery shapes into semi-finished copper and copper alloy products. The Directory covers wire rod plants, ingot makers (for castings), master alloy plants, brass mills, and electrodeposited copper foil mills. The 2013 edition includes a complete update of Chinese, Russian, India and Brazilian copper wire rod plants and projects. Published September 2015.

INSG Nickel in Batteries 2015
This report on the use of nickel in batteries draws on data from both government and private sources and describes the principal types of nickel-containing batteries, including those in hybrid and electric vehicles. Published July 2015.

World Copper Factbook 2015
A comprehensive overview of copper, with statistics, graphs, flowcharts and other information providing details on production, usage, recycling, definitions and history. Published September 2015.

Lead-Acid Industrial Batteries
This 77 page report provides details on markets for both motive and standby power batteries and also the emerging market for energy storage to support the deployment of renewable energy sources. Data on sales, output in kWh and lead tonnage are furnished. Different types of lead-acid batteries are assessed as well as competing chemistries such as nickel-cadmium and lithium-ion. Forecasts for growth by sector and region are included as are profiles of 40 industrial lead-acid battery producers. Published May 2015.

Capacity and Industrial Use of Refined Copper and Scrap in the Indian Subcontinent, ASEAN and Oceania 2015
This study covers over 3.75 million tonnes of copper and copper alloy semi-fabrication capacity in the region and a regional output of more than 2.65 kt for 2013. Reported output includes copper wire rod and copper fabricated products including tube, sheet and rod, as well as brass mill products including copper alloy tube, copper alloy sheet and copper alloy rod. Fabrication reported plant by plant and includes copper alloys and copper products. Published May 2015.

Zinc Recovery from Electric Arc Furnace Dust
This 62 page report, prepared for the ILZSG under contract, looks at aspects of the recovery of zinc from Electric Arc Furnace (EAF) dust, an increasingly significant source of secondary zinc. The advantages and disadvantages of the various processes used to treat EAF dust, including the Waelz Kiln and Rotary Hearth Furnace, are assessed. Information is provided on volumes of EAF dust being generated and recovered. An appendix provides a listing of dust treatment facilities by country. Published February 2015.

Primary Nickel Usage: New Frontiers in China
This publication was commissioned by INSG and carried out by Beijing Antaike Information Development Co. and provides a comprehensive overview of primary nickel usage in China. The production of stainless steel in China for the period of 2011-2018 by series - 200, 300 and 400 - is detailed with information on the top 10 stainless steel producers and top 10 NPI producers. Also, nickel usage in non stainless steel is broken down by main groups of first use of nickel - batteries, plating, nickel based alloys, alloy steels - and by type of product used - cathode, salts, scrap. Chinese NPI projects in Indonesia and elsewhere are discussed. Published March 2015.
Published 2014.

The Chinese Primary and Secondary Lead Metal Sector
The Chinese lead industry has developed rapidly mainly as a consequence of increased demand for lead-acid batteries from the automotive, e-bike and telecommunication sectors. This comprehensive report, prepared for ILZSG by Beijing Antaikai Development Co., provides an in depth assessment of Chinese primary and secondary lead output with details on the main producers, availability and sources of raw materials and processes used for recycling lead-acid batteries. 51 pages plus a 35 page appendix. Published December 2014.

Lead and Zinc New Mine and Smelter Projects 2015
This 69 page report covers lead and zinc mines and smelters opened or closed during 2014, firm projects currently committed and other projects under consideration. Developments in 46 countries spread throughout all the continents are covered with a total of over 200 separate entries. In addition, where available, estimates of ore reserves and the percentages of the metals they contain are also given. Published January 2014

Nickel – A Surface Technology Material
This study, carried out by Heinz Pariser on behalf of INSG, provides a comprehensive overview of the use of nickel in the plating and surface treatment industry, a sector accounting for about 10 percent of nickel usage. Several processes used in nickel plating are described, including electroplating, vapor deposition and zinc-nickel plating. Data is furnished on the industry by region and by major uses of plating such as the automotive sector, electro and electronics. 82 pages. Published May 2014.

China’s Nickel Mine and Refined Nickel Production 2014
This report, prepared for INSG by Beijing General Research Institute of Mining & Metallurgy (BGRIMM) provides the latest information on Chinese nickel mine production, reserves and resources as well as data on primary nickel production. Figures for refined nickel, nickel salts and nickel pig iron are provided. Trade data including imports of laterite and import and export of refined nickel are detailed. Published March 2014.

Middle East and North Africa Copper Use Study: Capacity and Industrial Use of Refined Copper and Scrap 2014
This regional study covers over 2.34 million tonnes of copper and copper alloy semi-fabrication capacity in the region. The 92 page report includes a plant by plant database, a country by country discussion of industrial copper use trends, and a country by country database of copper and copper alloy scrap trade in the region. Turkey, United Arab Emirates and Saudi Arabia have the most installed capacity with Iran, Egypt and other countries also covered in the report. Final version published November 2014.

Environment and Health Controls on Lead
A review of current and proposed regulations controlling lead in works, lead in the atmosphere and lead in water in 34 countries. Published 2014.

Environmental and Health Controls on Zinc
A review of current and proposed regulations controlling zinc in works, zinc in the atmosphere, zinc in water and recommended daily dietary allowance for humans and animals. Published 2014.
An authoritative study examining a wide range of issues and risks currently affecting the development of mineral and metals projects. The approach is global with a particular focus on copper, lead, zinc and nickel. The report covers all aspects of the metals producing sector including mining, smelting and refining and was undertaken by Oakdene Hollins of the UK on behalf of the ILZSG, ICSG and INSG. Published January 2014.

**Report on Risk Factors**

To place an order or for further information about the above and other publications published by the International Metals Study Groups please contact: sales@ilzsg.org for ILZSG reports, mail@icsg.org for ICSG reports, and insg@insg.org for INSG reports.

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**2014 China Brass Mills Survey: Copper Users ex-Wire Rod**
The ICSG March 2014 survey covers 343 Chinese producers with 6,345 ktpy capacity for copper and copper alloy products (excluding copper wire rod). The report provides details of past, current and expected capacity, output and use of copper scrap and refined copper. The relative importance of scrap versus refined copper in every industry group is explained in detail. Scrap availability, scrap spreads, prices and other factors impacting the industry are discussed. Forecasts for the period 2014-2016 are included for each product included in the survey. Published May 2014

**Environment, Health & Safety Regulations Relating to Nickel 2015**
A compilation of environmental, health and safety (EHS) regulations affecting nickel. The listing is provided by country, state or province as well as separately for international organizations. Available in a spreadsheet format with web links to regulations in various jurisdictions. 42 pages. Published April 2015.

**Cobalt as a By-Product of Copper and Nickel**
This joint INSG/ICSG report provides information on cobalt, and the relationship between nickel, copper and cobalt production, refining and use. The report, done by Roskill, has data on production and usage through 2012 as well as an outlook for cobalt mine capacity and production for the 2012 to 2018. Data on end-of-life recycling rates for cobalt-bearing products is also included. Published March 2014.

**Taxation, Royalties and Other Fiscal Measures Applied to the Non-Ferrous Metals Industry**
A joint report of the ILZSG, INSG and ICSG providing an in-depth analysis of taxation and fiscal incentives applied to non-ferrous metals in the major mining and metals producing countries. The research was carried out by Raw Materials Group (RMG) of Sweden on behalf of the Study Groups and is intended to be a valuable reference document for governments and companies. 50 pages. Published January 2014.

**2014 Data on End-Use of Copper**
The ICSG March 2014 survey covers 343 Chinese producers with 6,345 ktpy capacity for copper and copper alloy products (excluding copper wire rod). The report provides details of past, current and expected capacity, output and use of copper scrap and refined copper. The relative importance of scrap versus refined copper in every industry group is explained in detail. Scrap availability, scrap spreads, prices and other factors impacting the industry are discussed. Forecasts for the period 2014-2016 are included for each product included in the survey. Published May 2014

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ILZSG World Directory: Continuous Galvanizing Lines 2016
A planned update of a previous report which will provide information and a full listing of continuous galvanizing lines around the world. The Directory will include data on plant locations, annual capacities, annual zinc consumption and contact information. To be published in December 2016.

ICSG Directory of Copper Mines and Plants
The Directory highlights current capacity and provides a five year forecast of capacity for over 1,000 existing and planned copper mines, smelters and refineries on a country by country basis, with separate tables for SX-EW plants. Details for each operation are included and the Directory separates operations between Operating & Developing and Exploration & Feasibility stages. To be published in July 2016.

World Nickel-Based Alloys Market
This publication was commissioned by INSG and carried out by H.H. Pariser Alloy Metals & Steel Market Research and provides detailed information on the main drivers on the world primary nickel usage in the nickel-based alloys ("superalloys") sector. The study identifies the main nickel-based alloys producer worldwide, new investments in melting capacities, recent and future trends in nickel-based alloys demand and the primary nickel usage forecast in the period of 2015-2020. To be published in September 2016.

Study on the Main End Use Markets for Lead and Zinc in Europe
This report, which is being prepared for the ILZSG By Oakdene Hollins, will assess the way in which both lead and zinc are used in Europe extending historical work undertaken by the Group. An assessment and explanation of trends by first use will be provided for each European country where this information is available. First uses to be covered include automotive and industrial batteries, cable sheathing, rolled and extruded products and ammunition in the case of lead and continuous and general galvanizing, brass, semis and chemicals for zinc. To be published in November 2016.

Social Acceptance for Mineral and Metal Projects
This is a joint report of ILZSG, ICSG and INSG providing a detailed analysis of issues relating to the social acceptance of the mining and metals industry in various countries and jurisdictions. The research results are complemented by a range of case studies. To be published in December 2016.