UNCTAD

Multi-Year Expert Meeting on Commodities and Development 2013

Recent developments and new challenges in commodity markets, and policy options for commodity-based inclusive growth and sustainable development

Room XXVI
Palais des Nations
Geneva, Switzerland

Review and outlook for Copper, Nickel, Lead and Zinc

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Secretary-General
International Lead and Zinc Study Group
International Copper Study Group
International Nickel Study Group

20 MARCH 2013

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International Copper Study Group Introduction

- Formally established in 1992, following a series of UNCTAD expert meetings on copper.
- Headquarters in Lisbon, Portugal.
- Co-located with International Lead and Zinc Study Group and International Nickel Study Group since 2006.
- The Group is an intergovernmental organization consisting of 23 member governments plus the European Union representing copper producing and using countries

ICSG - MEMBERSHIP

- Membership is open to any country involved in copper production, consumption or international trade.

- Last two countries joining in 2011/2012: Zambia and Iran

- Current members are: Australia, Belgium, Chile, China, Finland, France, Germany, Greece, India, Iran, Italy, Japan, Luxembourg, Mexico, Peru, Poland, Portugal, the Russian Federation, Serbia, Spain, Sweden, the United States, Zambia and the European Commission.

- Possible new Member Countries: Mongolia, Brazil and DRC

ICSG - MAIN OBJECTIVES & FUNCTIONS

- To conduct consultations and exchanges of information on the international copper economy.
- To improve statistics on copper.
- To increase market transparency.
- To undertake studies on issues of interest to the Group.
- To consider special problems or difficulties that exist or may arise in the international copper economy.

ICSG endeavours to provide its membership with the most accurate, comprehensive and timely information on capacities, production, usage, trade, stocks, prices, technologies, research and development, and other areas that may influence the supply and demand for copper.

A FORUM FOR DISCUSSION

- **Markets**: forecasts of supply and demand for metals a year ahead
- **Trade**: monitoring of international trade in metals
- **Environmental policy**: sharing information on approaches to regulation
- **Industry Advisory Panel**: metals industry executives provide input to member governments
- Invite **observer countries, industry and observer organizations** such as UNCTAD, World Bank, UNIDO, Common Fund for Commodities and metals associations

ICSG MAIN PUBLICATIONS/OUTPUTS

Directory of Copper Mines & Plants (semi-annual): The Directory of Copper Mines and Plants highlights current capacity and provides a five year outlook of forecasted capacity for over 1,000 existing and planned copper mines, plants and refineries on a country by country basis, including separate tables for SX-EW plants. Salient details for each operation are included and the Directory separates operations between Operating & Developing and Exploration & Feasibility stages.

Directory of Copper & Copper Alloy Fabricators - First Use (annual): 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.

Publication prices refer to orders originating from institutions based in ICSG member countries

ICSG MAIN PUBLICATIONS/OUTPUTS

Copper Bulletin (monthly): includes annual and monthly statistics, by country, on copper mine, smelter, refined and semis production, copper usage and trade, as well as stocks and exchange prices, providing a global view of supply and demand.

Statistical Yearbook : As above, covering the past 10 years.

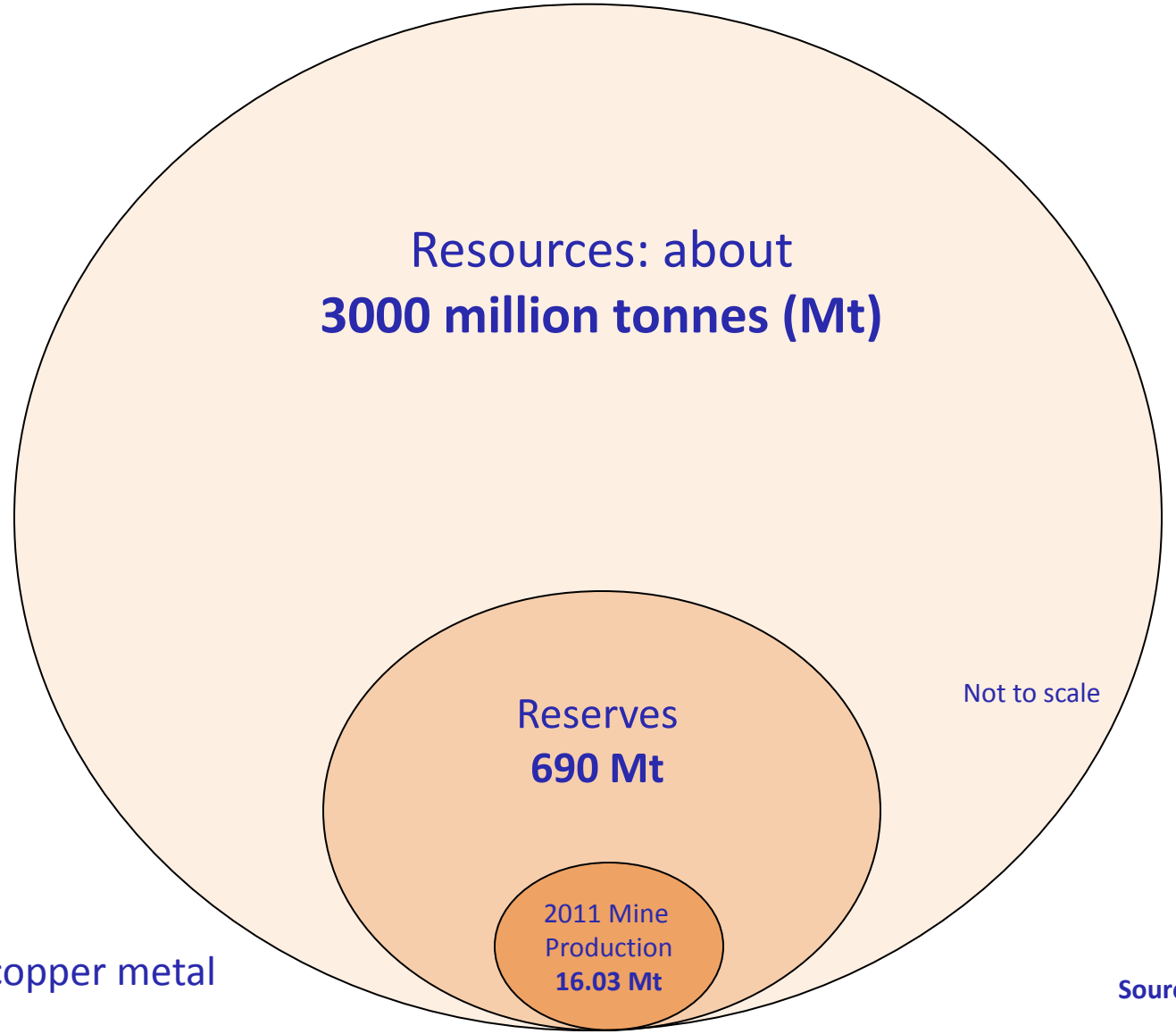
Monthly Press Release on the state of the copper market (to be included in the email distribution list please contact mail@icsg.org)

World Copper Market Forecast: Prepared twice a year for the following two years.

Copper Factbook: The Factbook provides a broad overview of all facets of copper, from production to trade, usage, recycling and more. It is designed to promote copper and educate readers about the importance and contribution of copper to society. Available in ICSG Website, in PDF and in hard copies.

Publication prices refer to orders originating from institutions based in ICSG member countries

World Copper Reserves 2011



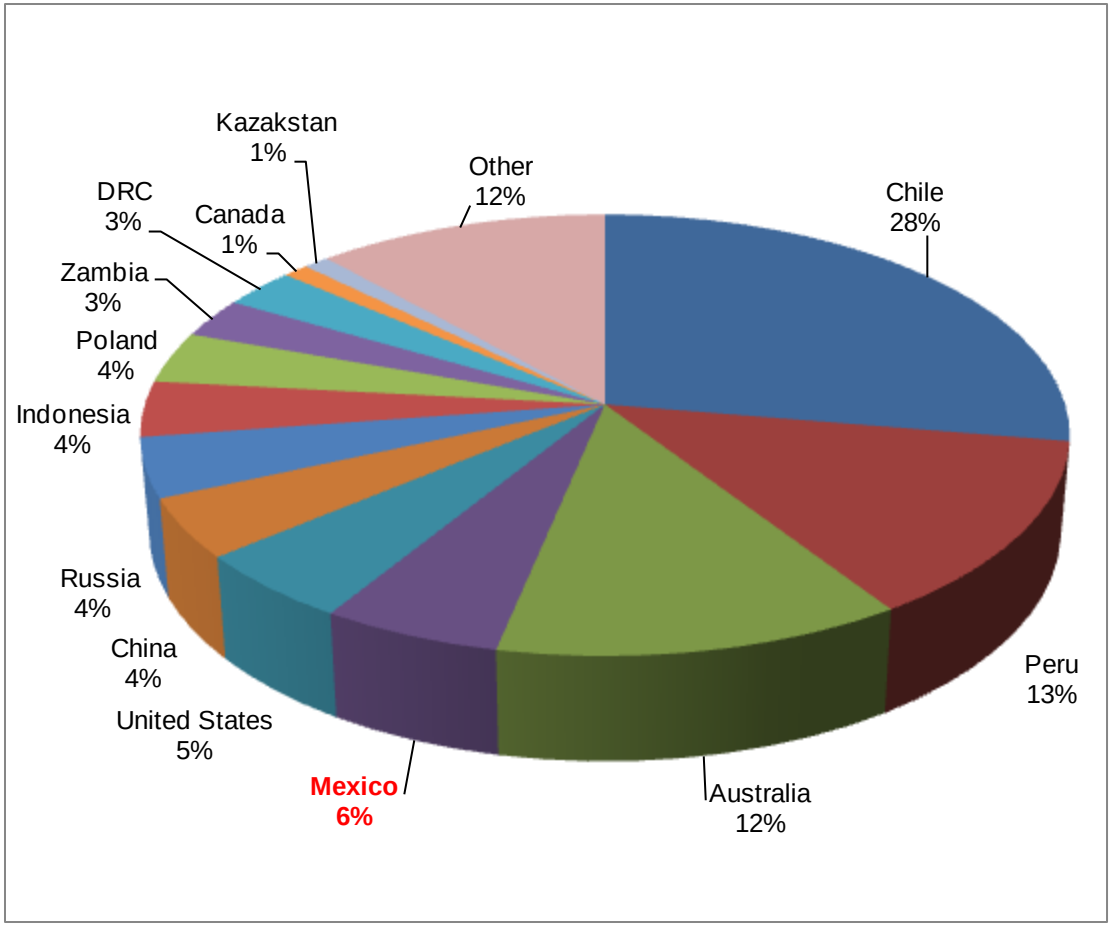
contained copper metal

Sources: USGS

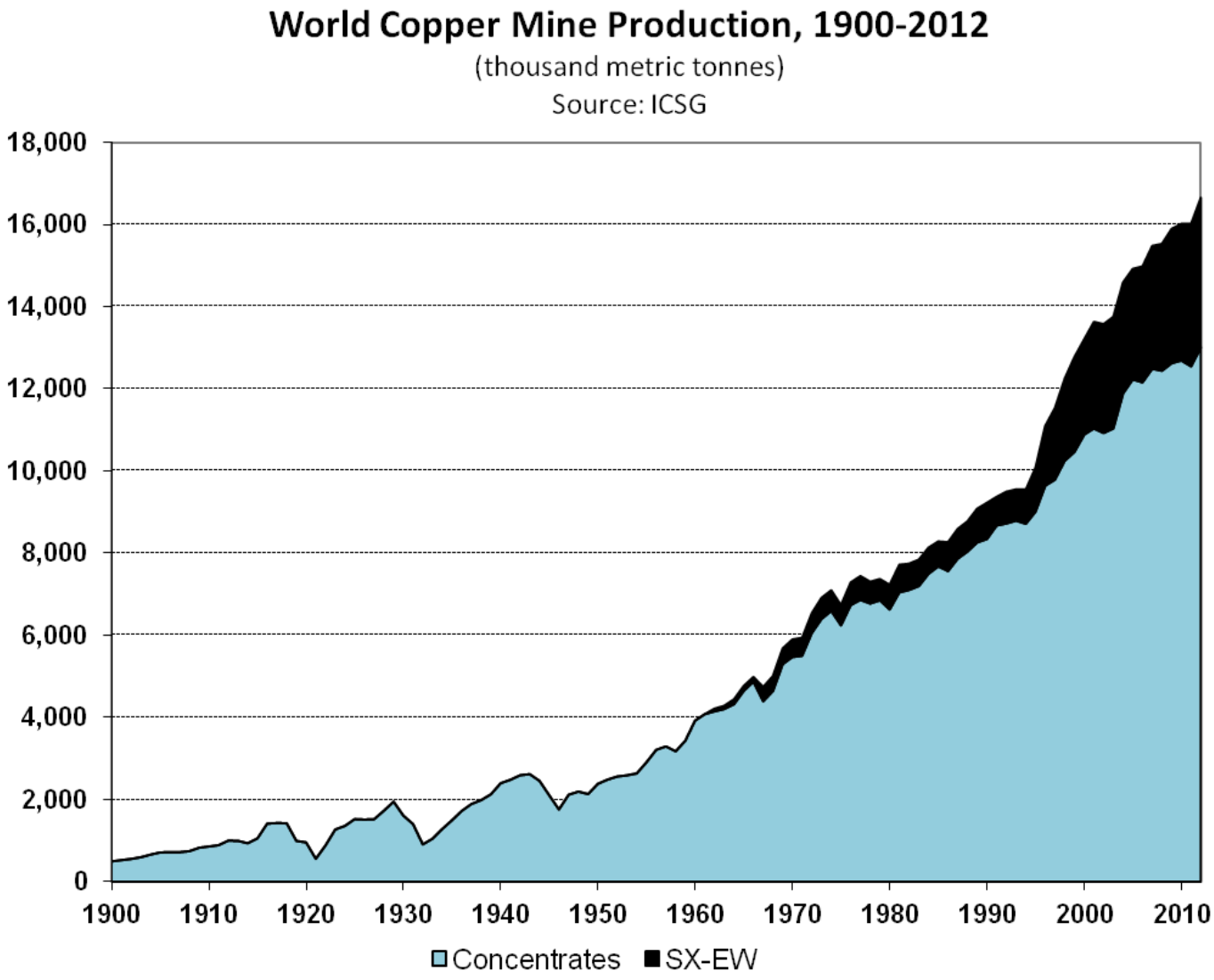
World Copper Reserves
2011 Breakdown

Source: USGS

- Despite increased consumption of copper produced from ore in recent years, increases in reserves have grown more, and there is more copper available to the world than at any other time in the past.



Mexico accounts for around 6% of World Copper Reserves reported by USGS



Average annual grow rate in the last century: 4%

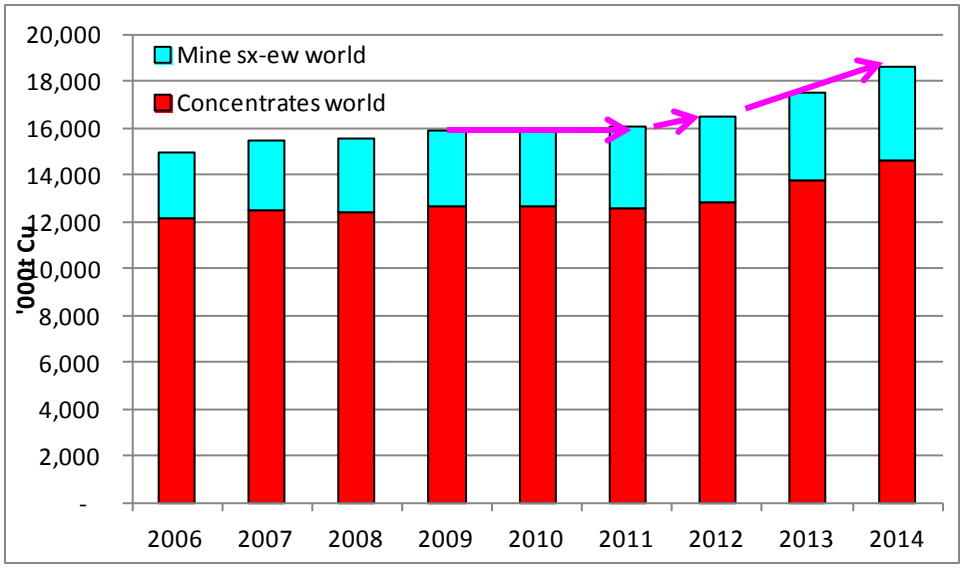
Average annual grow rate in the last decade: 2.1 %

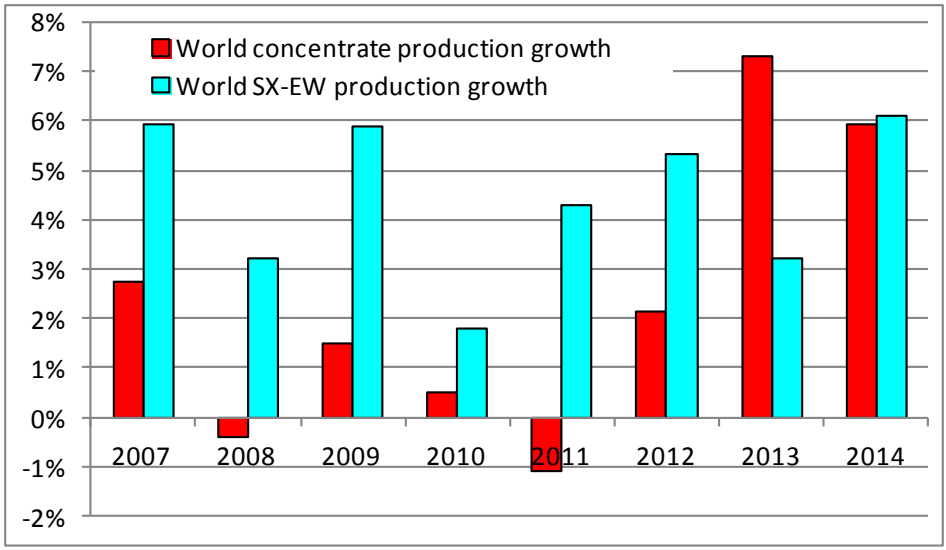
Average annual grow rate in the last 3 years: 1.2%

Source: ICSG

2012/2014 Main Global Assumptions for Mine Production

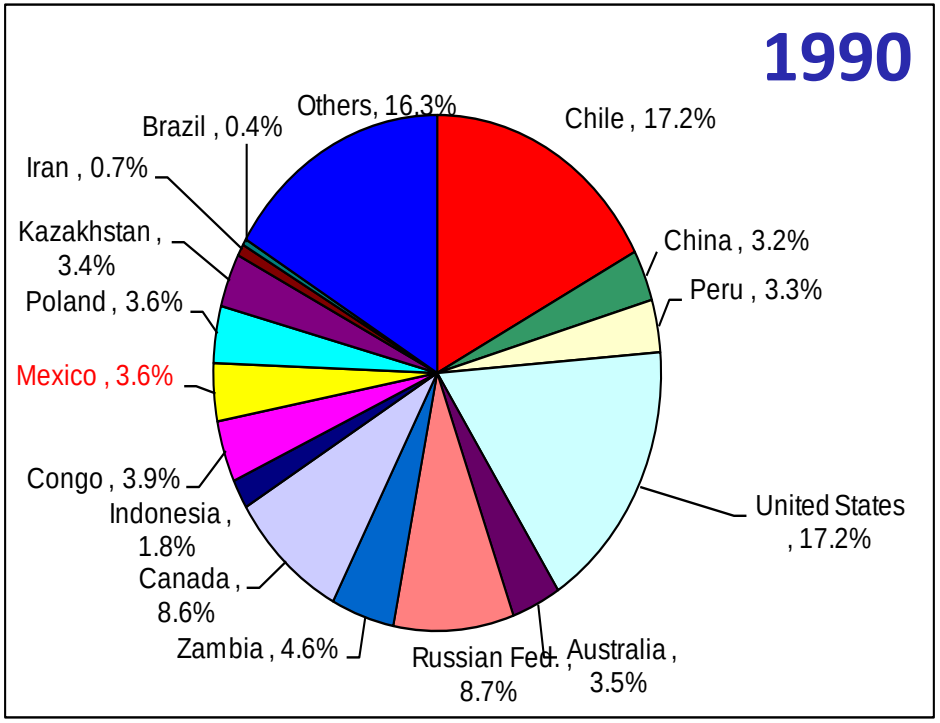
- The 2008 crisis had a severe impact on copper projects development and the postponement of many projects: no new major project until 2012.
- Mine production growth averaged a disappointing 0.9% growth in the period 2008-2011 (concentrate growth was flat)
- However smaller and medium size mine projects stared in 2012 and 2012 production recovered from 2011operational constrains
- Capacity expansions occurring in Chile, Mexico and Peru
- Major mine projects start by end 2013 and in 2014 boosting world production (eg. Oyu Tolgoi)
- The supply constraint factors that have been affecting the copper industry in the last few years will expected continue to impact supply.
- World copper mine production expected to grow by around 6% in 2013, after a growth of about 3% in 2012

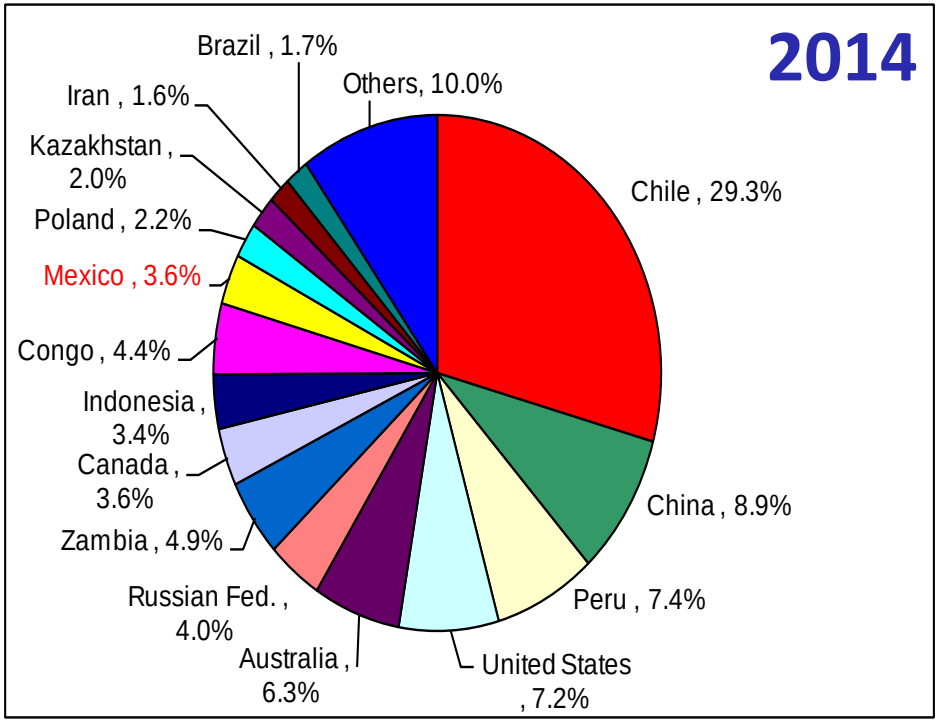




Source: ICSG

Distribution of Copper Mine Production by Country



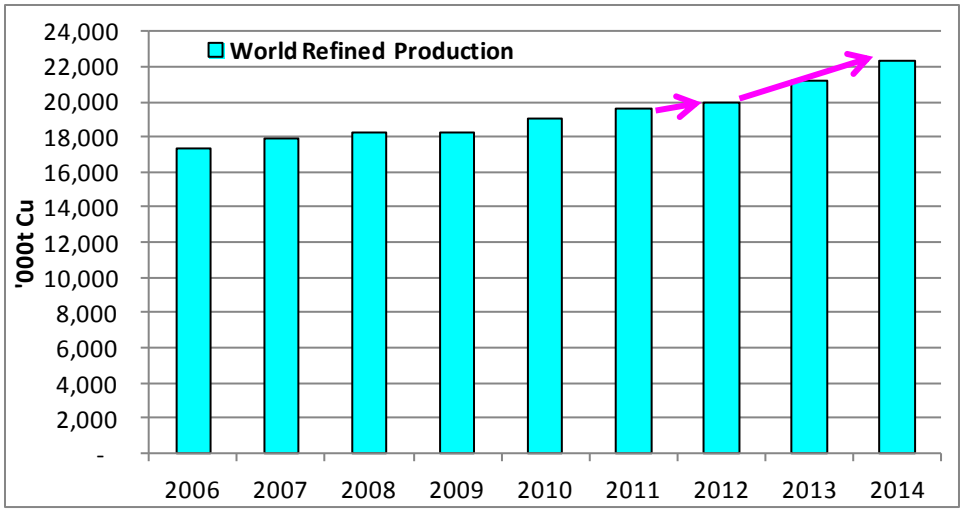


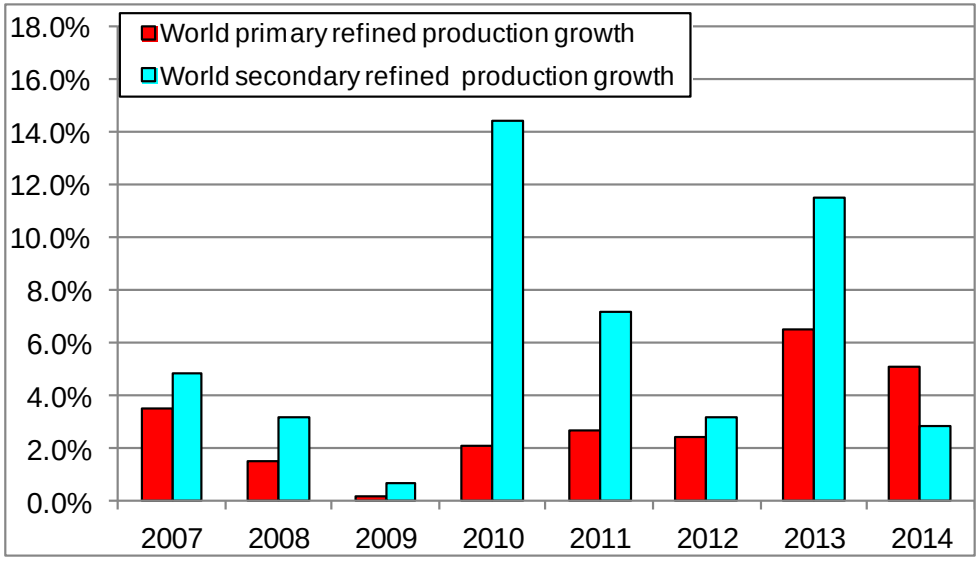
Chile to continue the biggest copper mine producer in the world
United States loosing share and Peru increasing its share
Mexico maintaining the same share at around 3.6%

Source: ICSG

2012/2014 Main Global Assumptions for Refined Production

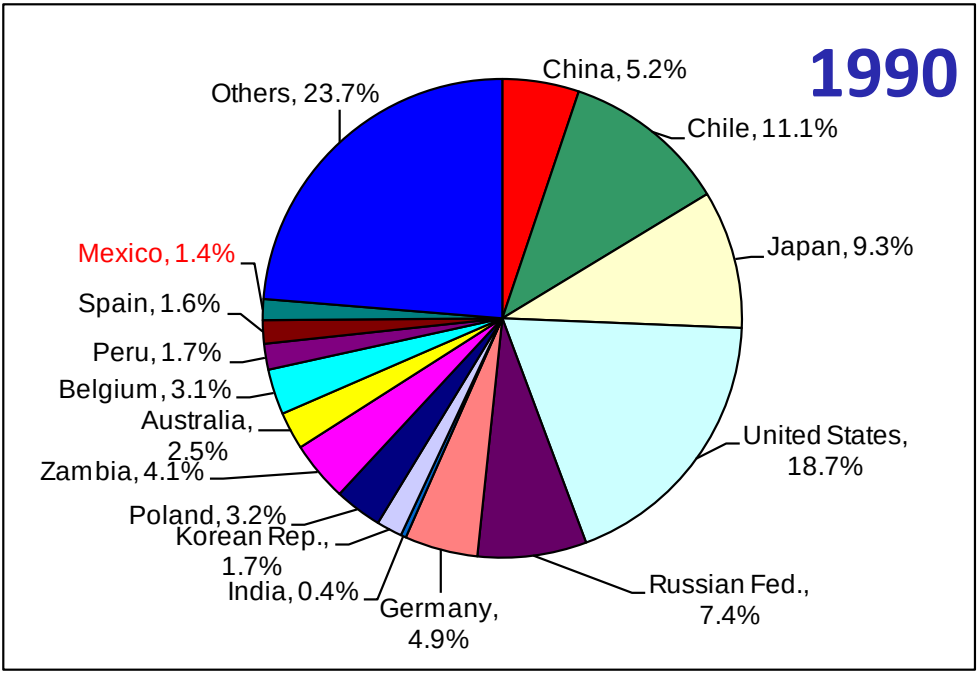
- 2012 Japanese refined production recovered from low 2011 levels. (earthquake)
- 2013 world refined production recovering from extended maintenances occurring in 2012
- Chinese refined production continuing its strong expansion
- Expected improved capacity utilization rates at Indian refineries.
- Two new refineries that started in Turkey and in Kazakhstan in 2011 bringing new supply in 2012/2013
- Primary electrolytic refinery production to remain constrained by shortage of concentrates
- World secondary production expected to grow by 11% in 2013 and share in total output to be around 19%
- World copper refined production expected to grow by around 6% in 2013, after a growth of about 2% in 2012

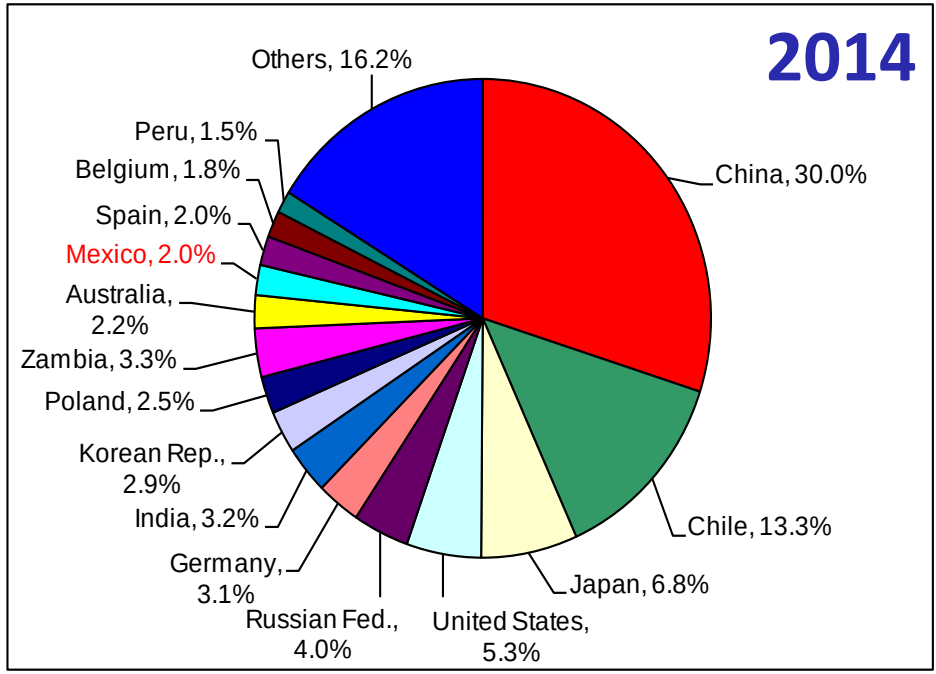




Source: ICSG

Distribution of Copper Refined Production by Country





Strong growth in Chinese refined production, up from 5% of world share in 1990 to 30% by 2014

United States and Japan loosing share

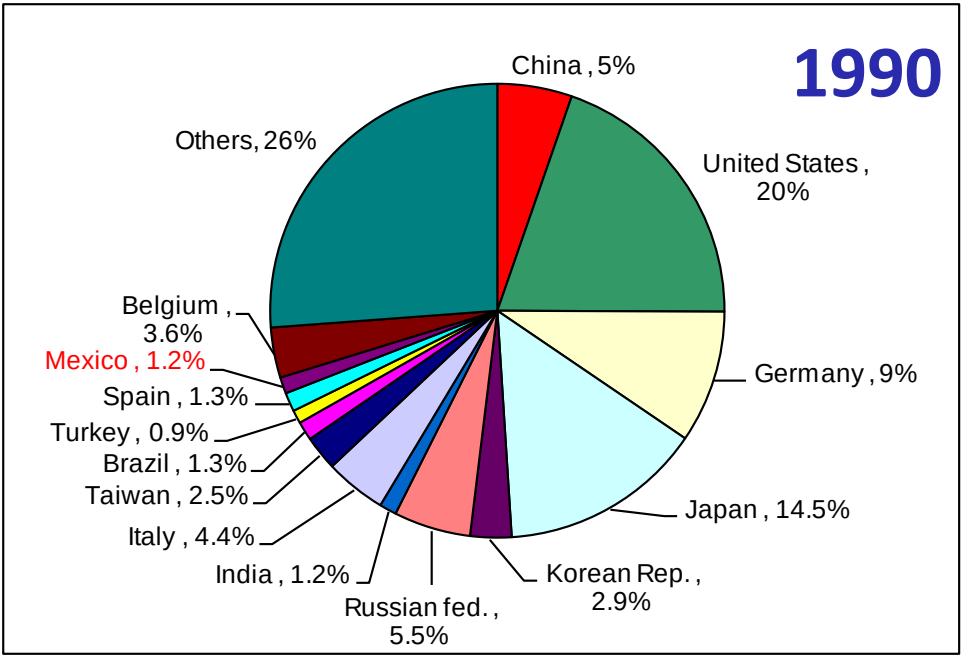
Mexico growing from 1.4% to 2%

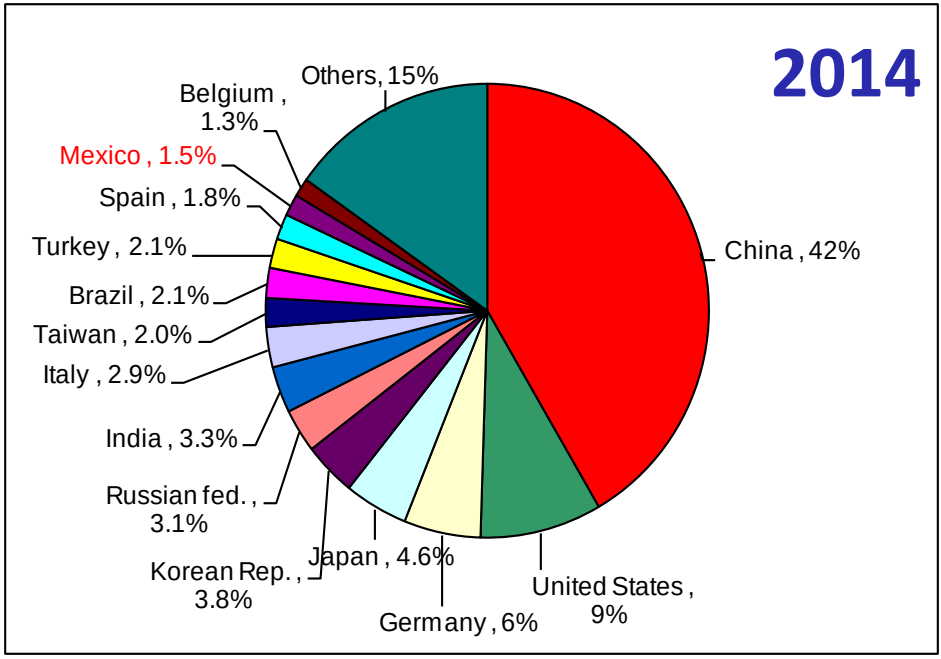
Source: ICSG

2012/2014 Main Global Assumptions for Usage

- Copper consuming sectors growth linked to the performance of the world economy.
- World GDP should pick up gradually during 2013/2014 supporting global usage growth. However regional divergences occur with lower growth in some regions than others. Globally, the downside risk remains elevated
- Stimulus packs by some governments supportive of usage growth
- Improved outlook for the US economy, lower wirerod imports and new wirerod plant positive for usage in 2012-2014
- Uncertainty on EU sovereign debt issues and economy contraction negatively impacting usage in 2012 with small recovery anticipated for 2013 and 2014
- Japan's usage is expected to remain practically unchanged in the period 2012-2014
- Indian urbanization and industrialization should continue to boost copper usage and supporting growth in 2013 and 2014.
- Unstable political situation in the Middle East and North Africa affecting usage in the region in 2011-2012 and only small growths expected for 2013-2014
- Global green applications such as wind farms are a growing sector boosting world copper usage.
- Substitution remains a threat when copper prices remain high.
- In 2012, China apparent usage growth (+11%) inflated by high net cathode imports. However, anecdotal evidence suggests that the high imports were accompanied by an increase in inventories held in bonded warehouses. Chinese usage growth in 2013/2014 expected to be lower than in previous years.

Distribution of Copper Refined Usage by Country





Strong growth in Chinese refined usage, up from 5% of world share in 1990 to more than 40% by 2014

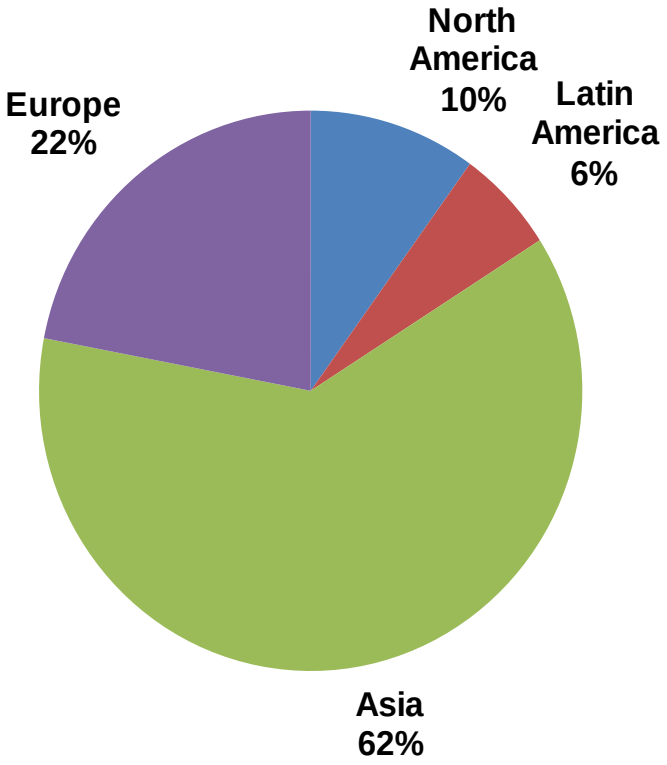
United States share in world usage declining from 20% to 9%

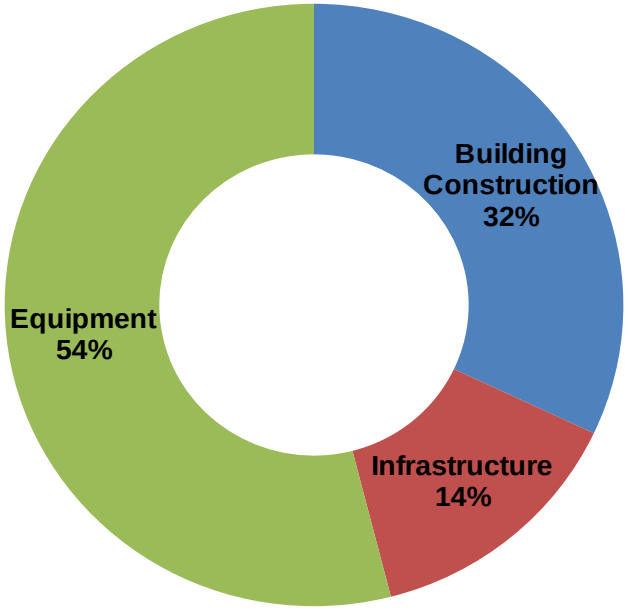
Mexico growing slightly from 1.2% to 1.5%

Source: ICSG

Major Uses of Copper: Usage by Region and End Use Sector, 2010

Basis: copper content, thousand metric tonnes
Source: International Copper Association





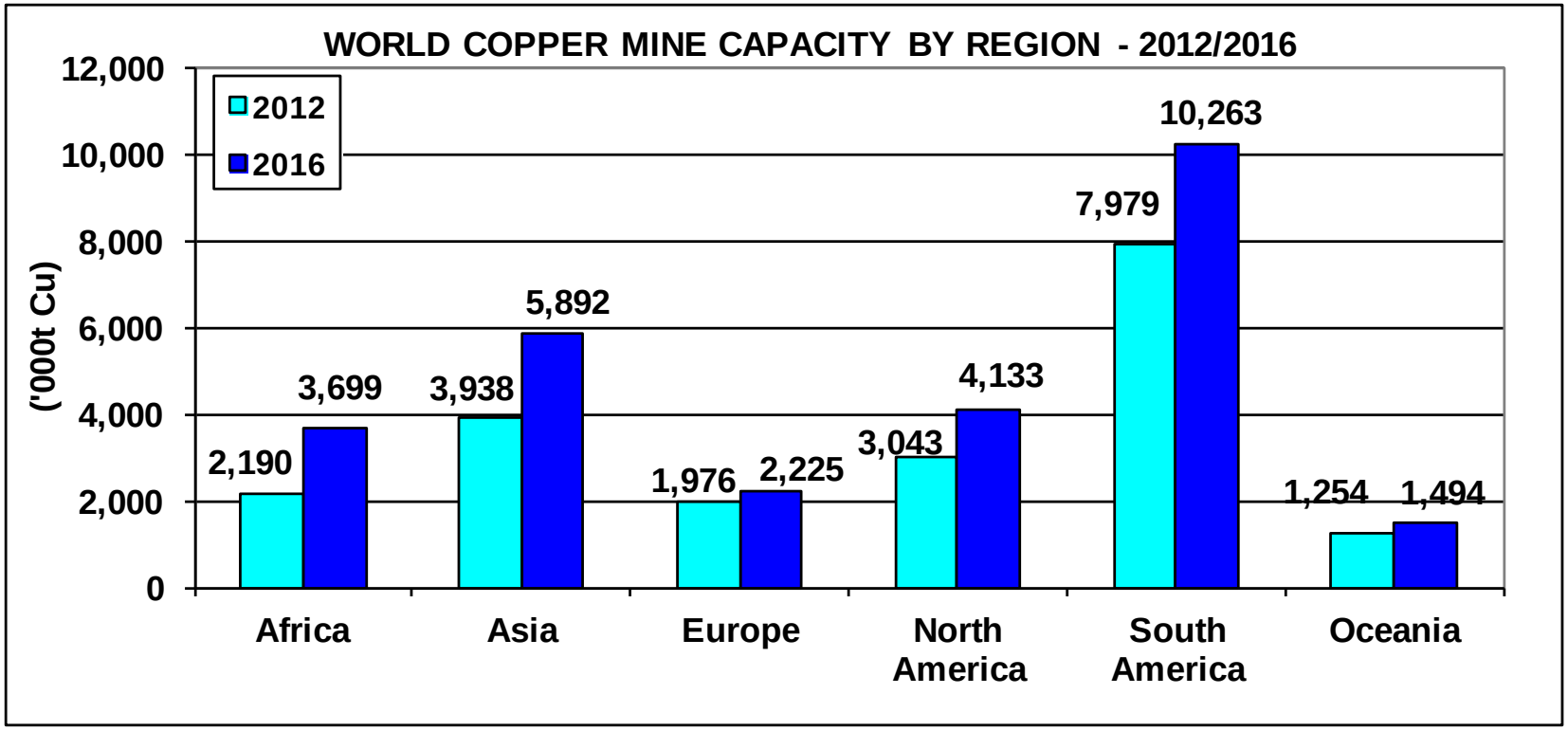
ICSG World Copper forecast (Oct 2012) – summary table

FORECAST TO 2013									
REGIONS	**MINE PRODUCTION**			**REFINED PRODUCTION**			**REFINED USAGE**		
(1000 t)	**2011**	**2012**	**2013**	**2011**	**2012**	**2013**	**2011**	**2012**	**2013**
Africa	1,306	1,396	1,712	961	1,064	1,326	281	256	262
N.America	2,150	2,244	2,536	1,706	1,701	1,886	2,202	2,241	2,340
Latin America	6,848	6,993	7,209	3,717	3,463	3,606	600	608	641
Asean-10	765	653	909	517	398	575	734	788	819
Asia ex Asean/CIS	1,768	1,977	2,298	8,048	8,772	9,367	11,331	12,005	12,014
Asia-CIS	470	487	500	428	447	472	99	100	101
EU-27	788	804	814	2,716	2,768	2,790	3,295	3,137	3,207
Europe Others	832	853	870	1,080	1,049	1,095	1,202	1,120	1,173
Oceania	1,092	1,118	1,300	477	503	504	120	122	125
TOTAL	16,019	16,524	18,147	19,651	20,166	21,620	19,865	20,376	20,682
World adjusted 1/ 2/	16,019	16,479	17,533	19,651	19,950	21,140	19,865	20,376	20,682
% change		2.9%	6.4%		1.5%	6.0%		2.6%	1.5%
Refined Production - Usage Balance							**-214**	**-426**	**458**

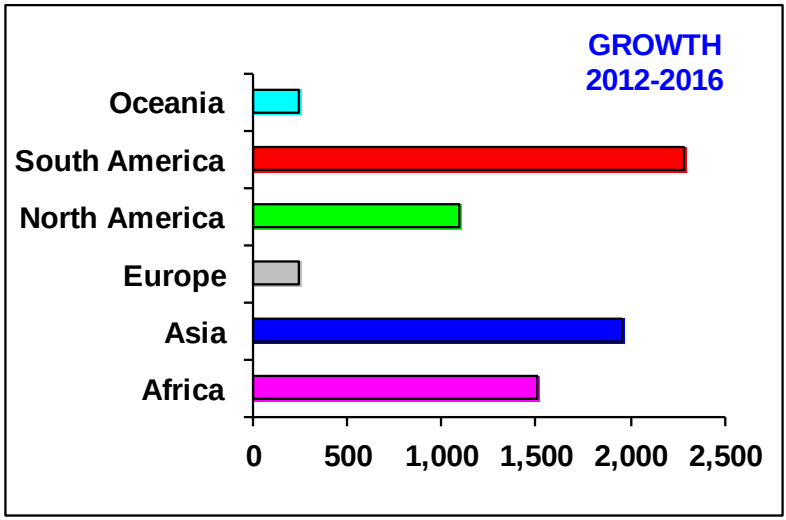
1/ Based on a formula for the difference between the projected copper availability in concentrates and the projected use in primary refined production; 2/ based on average ICSG forecast deviations for pre-recession years 2003/2007.

With production growth expected to exceed demand growth in 2013 and 2014, the market is foreseen to return to surplus after three years of consecutive deficits

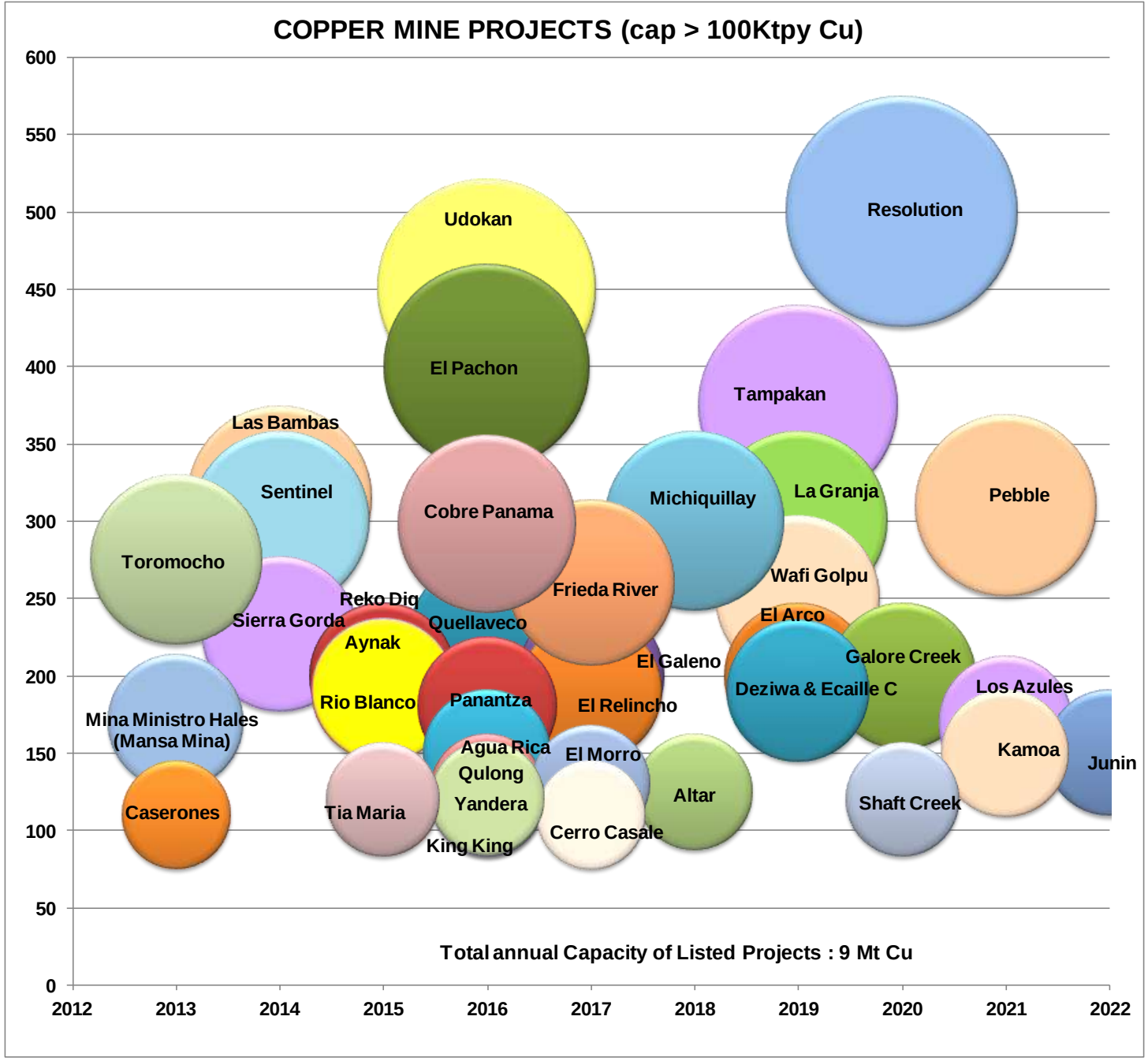
The International Copper Study Group recognized that numerous factors including a world economic slow down, European Union sovereign debt issues, political disturbances in the Middle East and North Africa, and market price volatility create significant uncertainty, and that the global market balances could vary from those projected



- South America will remain the region with the largest copper mine installed capacity and is expected to bring to the market until 2016 an additional 2.3 Mt capacity.
- Asian and African copper mining capacity also increasing substantially.
- All together, these three regions represent 78% of the world additional copper mine production capacity to come on stream by 2016.



Source: ICSG Directory of Copper Mines and Plants – February 2013



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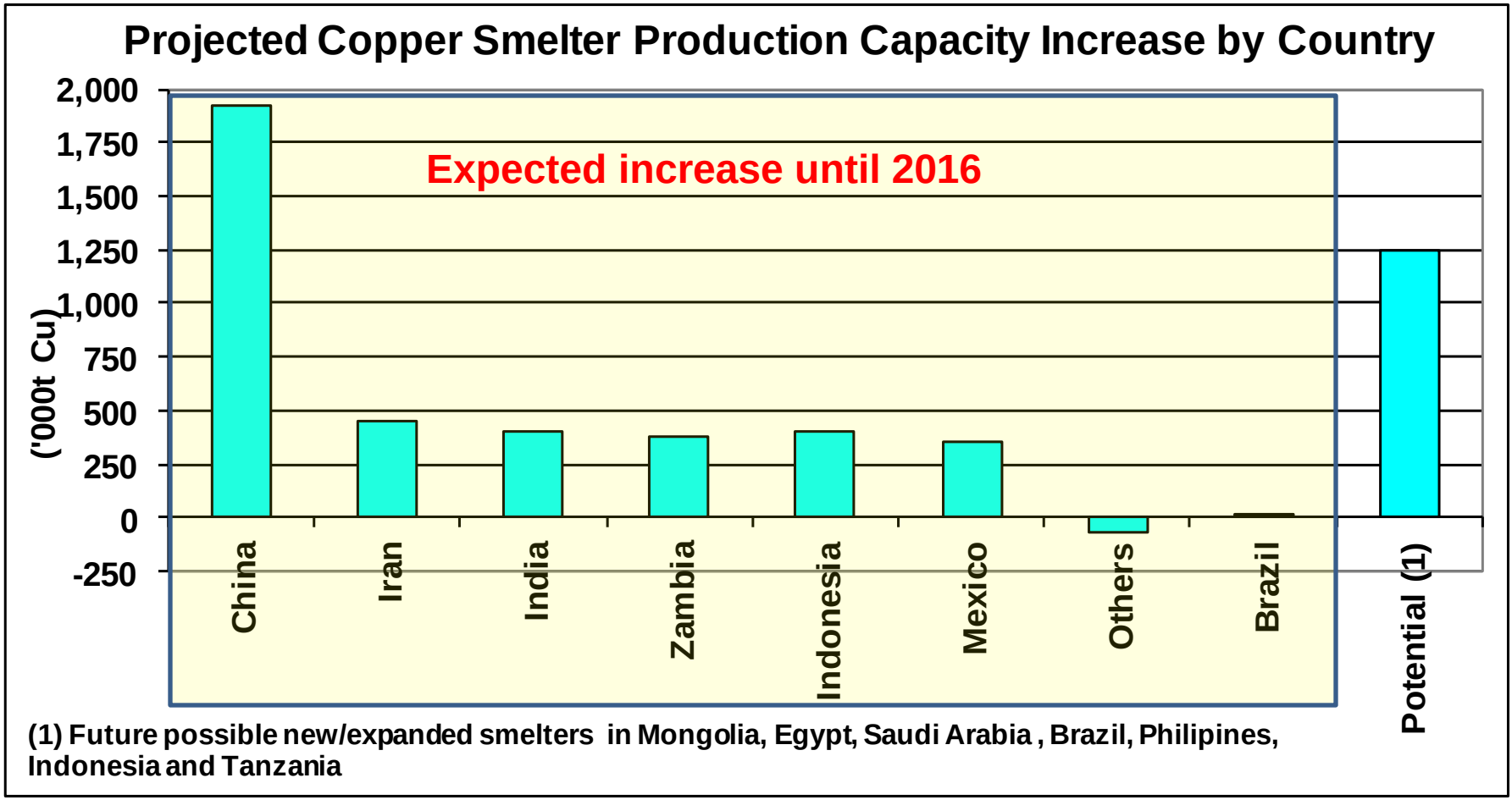


- China will continue to increase its smelting capacity through expansions and new projects.
- Some expansions, new projects occuring in other few countries
- Indonesi new mining law on banning ore exports leading to the development of new smelter projects in the country
- In August 2010 Grupo Mexico announced plans for a smelter/refinery project (Empalme) to start in Mexico in 2016 with a capacity of 350ktpy (development not yet confirmed)

Source: ICSG Directory of Copper Mines and Plants – February 2013

International Nickel Study Group

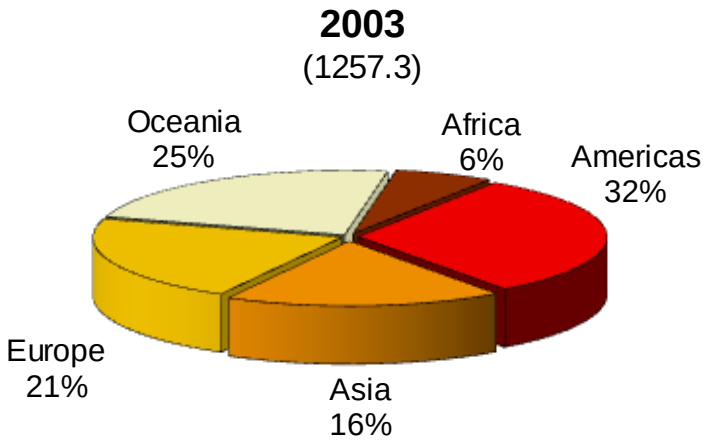
- An Autonomous International Governmental Organization
- Co-located in Lisbon, Portugal with **International Lead & Zinc and Copper Study Groups**, resulting in significant cost savings
- Enhancement of market transparency in the world nickel market
- Forum for discussions on nickel issues.

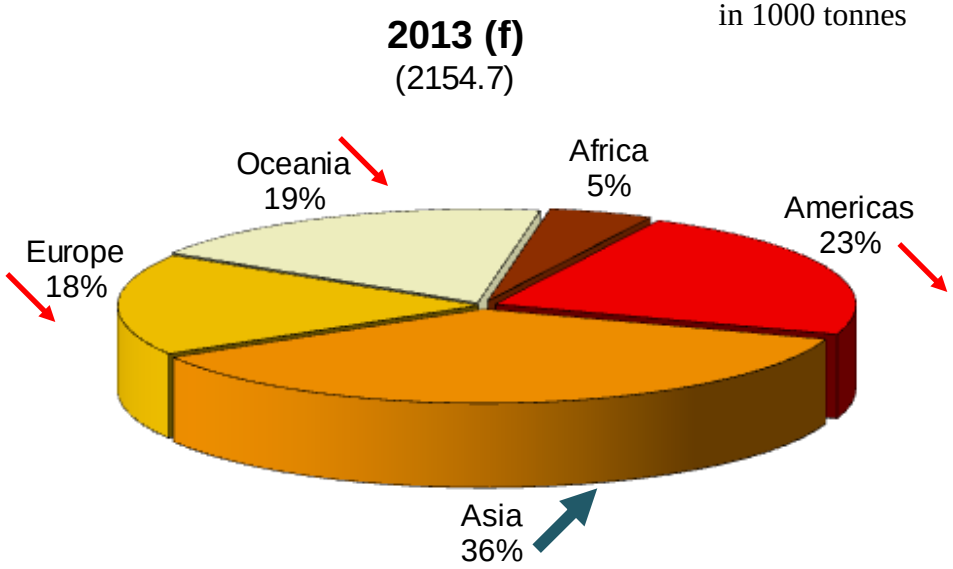
INSG Member Countries

- Australia
- Brazil
- Cuba
- European Union
- Finland
- France
- Germany
- Greece
- Italy
- Japan
- Norway
- Portugal
- Russian Federation
- Sweden
- United Kingdom

World Nickel Ore Production (2/2)

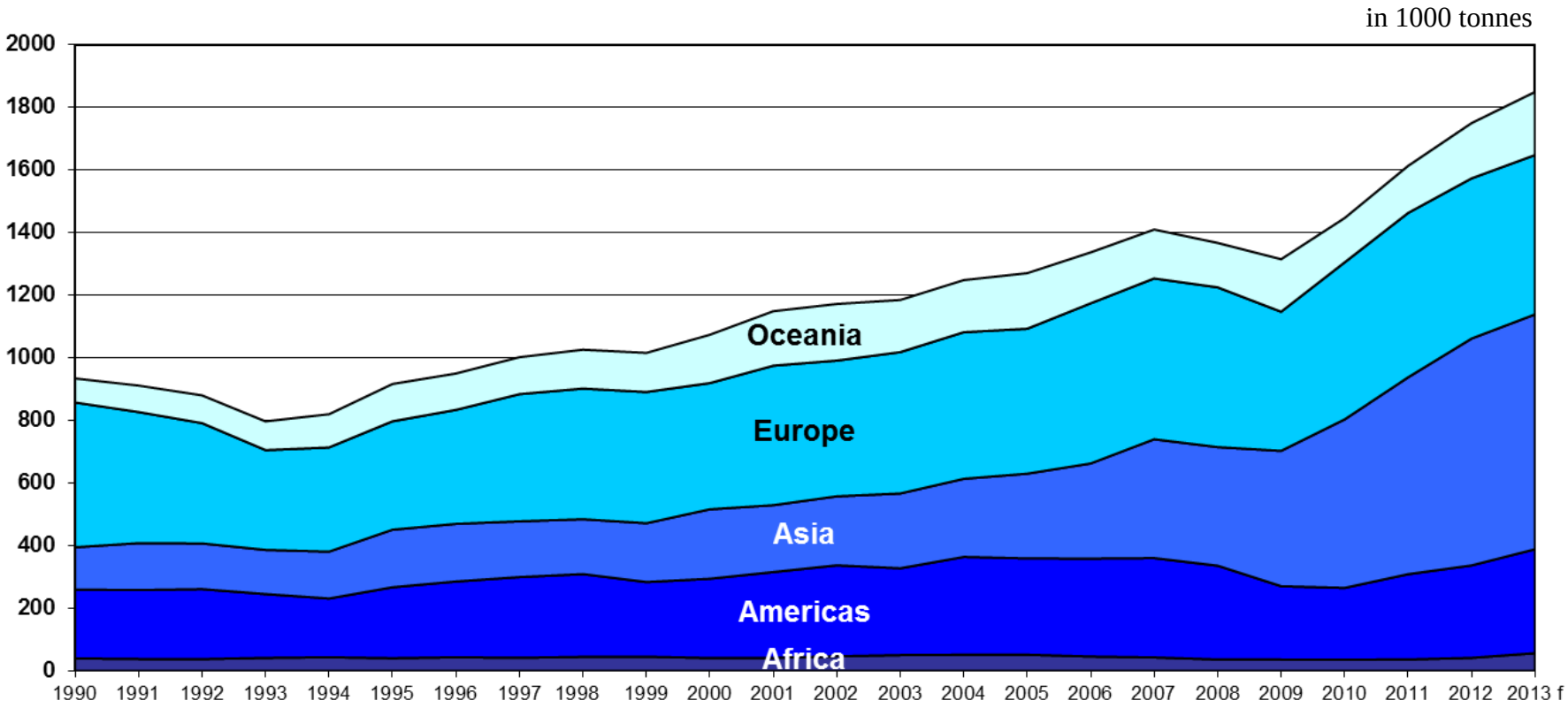
in 1000 tonnes





(f) forecast October 2012;
Asia adjusted in March 2013.

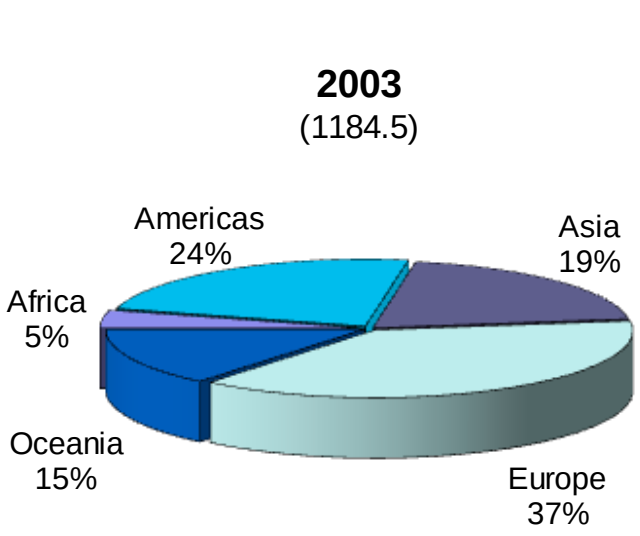
World Primary Nickel Production (1/2)

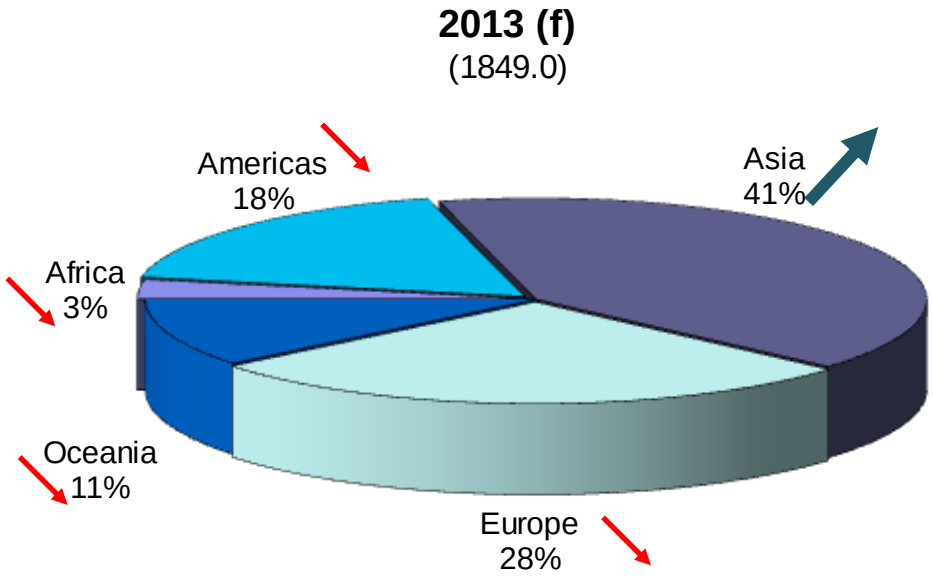


(f) forecast October 2012;
Americas, Asia and Europe adjusted in March 2013.

World Primary Nickel Production (2/2)

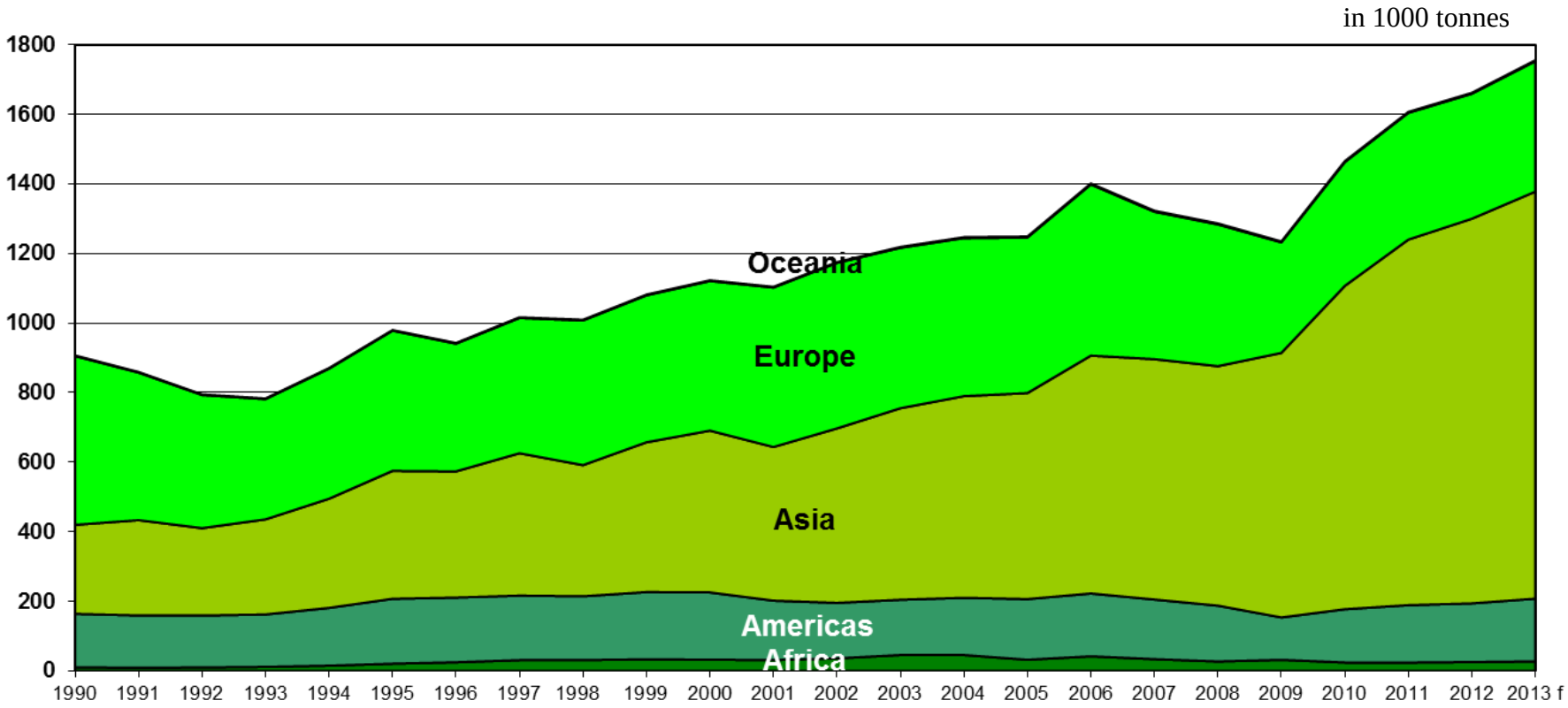
in 1000 tonnes





(f) forecast October 2012;
Americas, Asia and Europe adjusted in March 2013.

World Primary Nickel Usage (consumption) (1/2)



(f) forecast October 2012;
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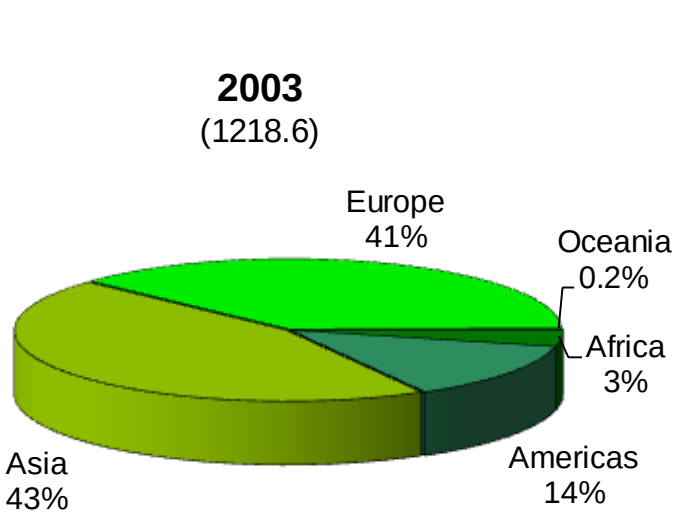
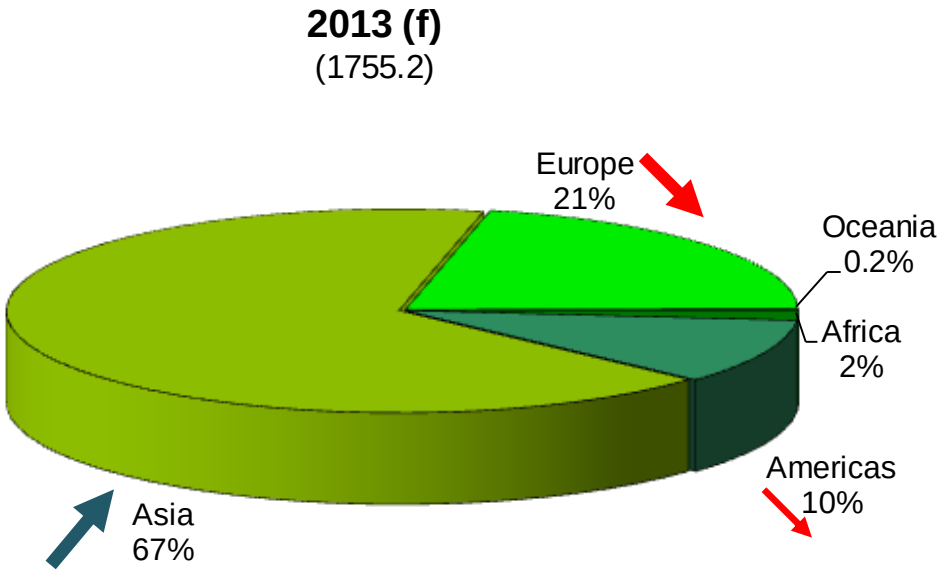
World Primary Nickel Usage (consumption) (2/2)

in 1000 tonnes

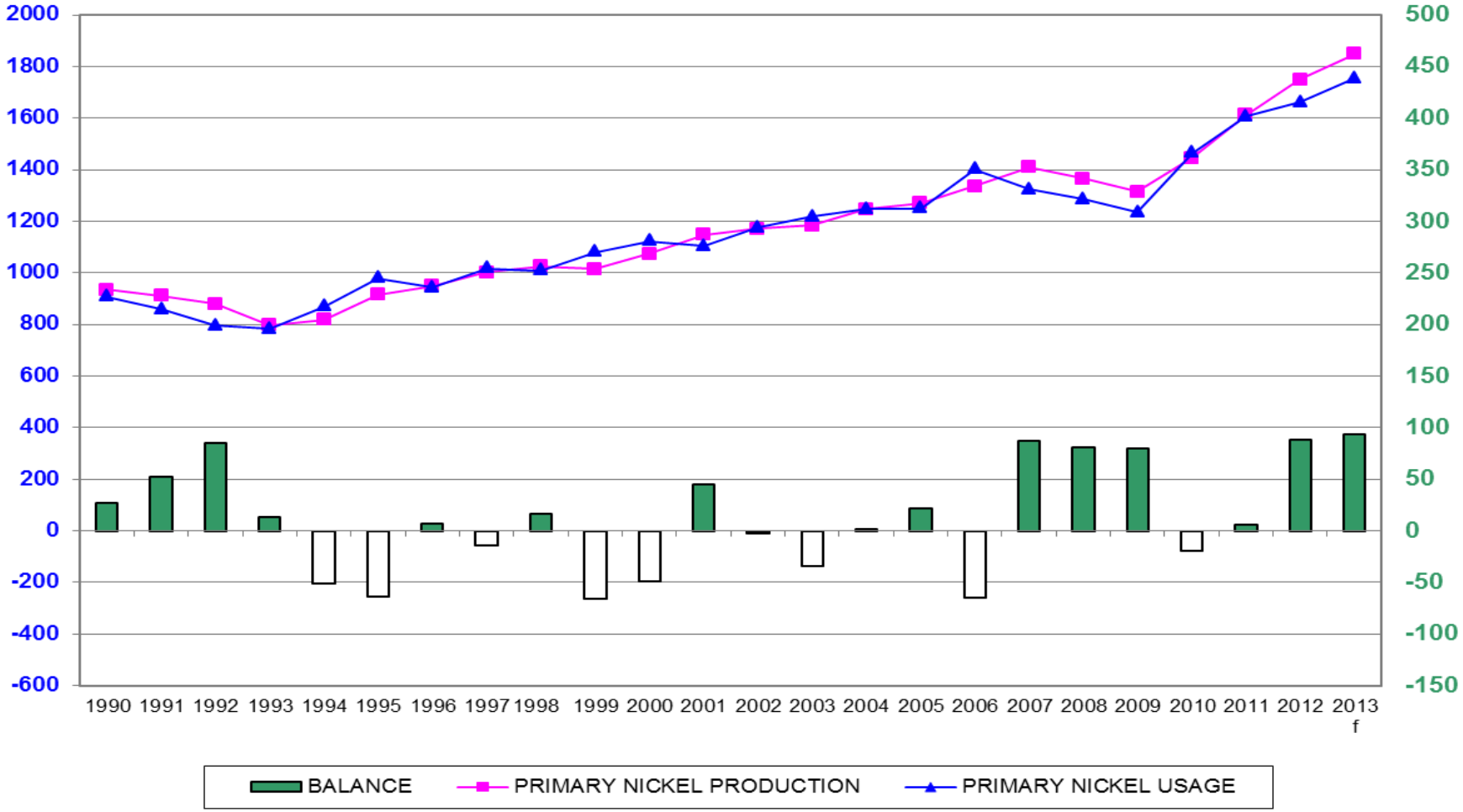




(f) forecast October 2012;
Asia adjusted in March 2013.

World Primary Nickel Balance - annual

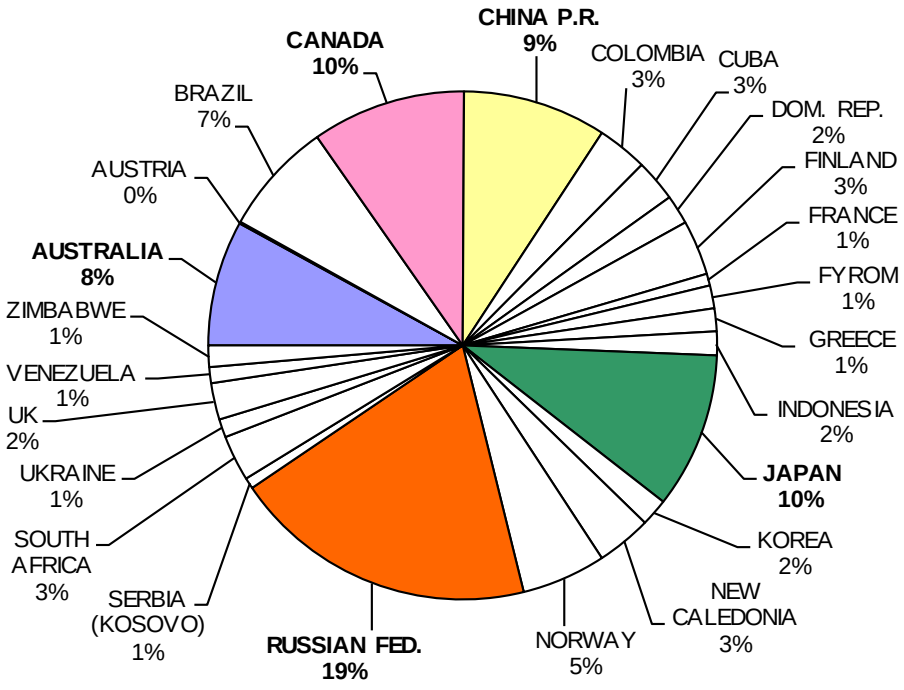
in 1000 tonnes



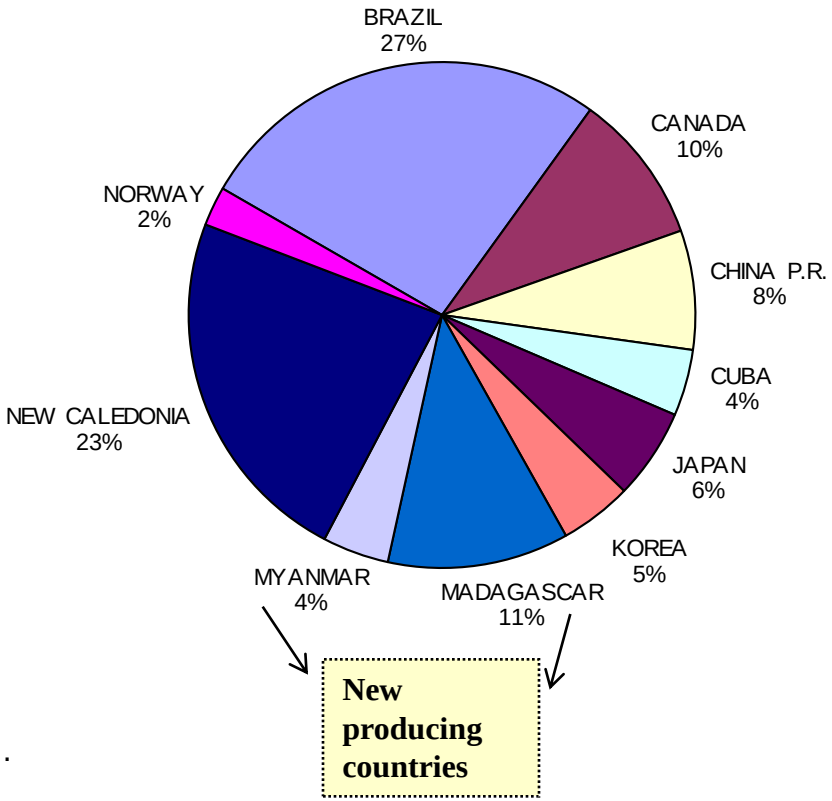
(f) forecast October 2012;
Americas, Asia and Europe adjusted in March 2013.

Primary Nickel Capacity by Country

2011: ≈ 1.7Mt



New committed developments: ≈ 0.5Mt



Note: excluding NPI.

New Nickel Capacity on Stream / Ramp Up

Project Name / Country	Product	Mode	Estimated Production	Projected Total Production	Remarks
Ambatovy / Madagascar	Class I	Ramp Up	≈ 35 000	60 000	Open market
Tagaung Taung / Myanmar	FeNi	Ramp Up	≈ 10 000	22 000	China
Koniambo / New Caledonia	FeNi	Start Up	≈ 16 000	60 000	Open market
Onça Puma / Brazil	FeNi	Ramp Up	≈ 30 000	58 000	Open market
Barro Alto / Brazil	FeNi	Ramp Up	≈ 27 000	36 000	Open market
Goro / New Caledonia	Semi / Class I	Ramp Up	≈ 26 000	60 000	Australia & China
Ramu / PNG	Semi	Ramp Up	≈ 13 000	30 000	China & Other
Talvivaara / Finland	Semi	Ramp Up	≈ 18 000	35 000	Finland
Raventhorpe / Australia	Semi	Ramp Up	≈ 33 000	39 000	Australia & Other
Santa Rita / Brazil	Conc.	Ramp Up	≈ 23 000	25 000	Brazil & Finland
Kevitsa / Finland	Conc.	Start Up	≈ 9 000	10 000	Open market
Long Harbour / Canada	Class I	Start Up	≈ 10 000	50 000	Mainly replacement
Taganito / The Philippines	Semi	Start Up	≈ 6 000	30 000	Japan

Note: no Chinese NPI projects included.

World Nickel Ore Production 2010 to 2013 (f)

in 1000 tonnes

Area	2010	2011	% change	2012	% change	2013 (f)	% change
Africa	80.1	79.5	-0.8	89.5	12.5	101.0	12.9
America	367.2	482.7	31.5	488.1	1.1	490.0	0.4
Asia	504.8	662.4	31.2	732.5	10.6	780.0	6.5
Europe	325.4	361.5	11.1	343.5	-5.0	377.7	9.9
Oceania	298.4	346.1	16.0	375.8	8.6	406.0	8.0
Total	**1575.8**	**1932.3**	22.6	**2029.4**	5.0	**2154.7**	6.2

(f) forecast October 2012;
Asia adjusted in March 2013.

World Primary Nickel Production 2010 to 2013 (f)

in 1000 tonnes

Area	2010	2011	% change	2012	% change	2013 (f)	% change
Africa	36.0	36.4	1.0	41.7	14.6	56.5	35.6
America	229.0	272.4	18.9	295.2	8.4	332.0	12.5
Asia	538.0	628.7	16.9	724.4	15.2	750.0	3.5
Europe	501.6	525.1	4.7	511.6	-2.6	509.0	-0.5
Oceania	141.4	150.2	6.2	176.5	17.5	201.5	14.2
Total	**1446.0**	**1612.7**	11.5	**1749.4**	8.5	**1849.0**	5.7

(f) forecast October 2012;
Americas, Asia and Europe adjusted in March 2013.

World Primary Nickel Usage 2010 to 2013 (f)

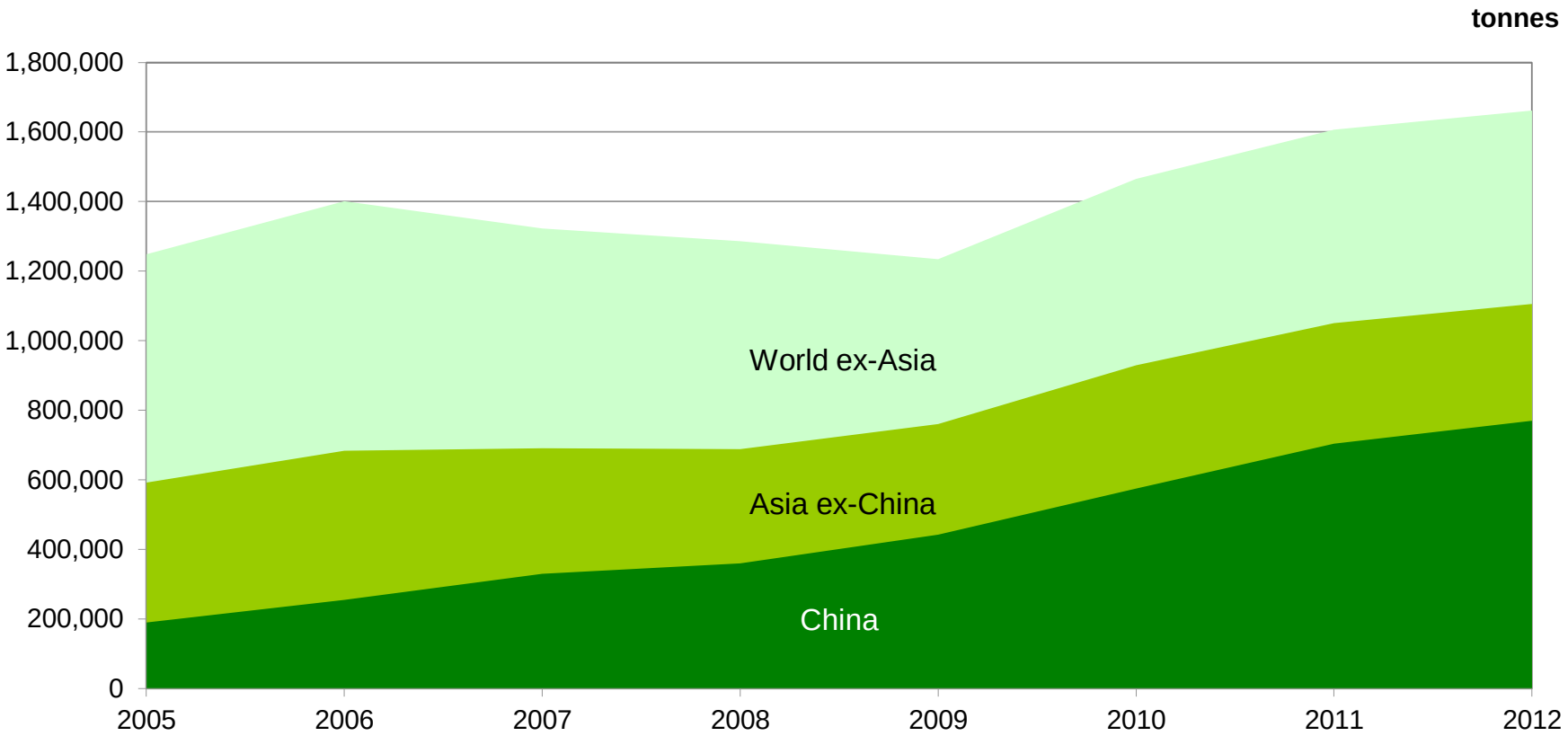
in 1000 tonnes

Area	2010	2011	% change	2012	% change	2013 (f)	% change
Africa	24.0	23.9	-0.4	25.3	5.9	27.2	7.5
America	153.2	165.0	7.7	168.7	2.2	180.3	6.9
Asia	929.4	1050.6	13.0	1105.7	5.2	1170.0	5.8
Europe	355.9	364.5	2.4	359.3	-1.4	374.9	4.3
Oceania	2.7	2.7	0.0	2.7	0.0	2.8	3.7
Total	**1465.2**	**1606.7**	**9.7**	**1661.7**	**3.4**	**1755.2**	**5.6**

(f) forecast October 2012;
Asia adjusted in March 2013.

The impact of Asia and China

Nickel Usage (Consumption)



Asia: 47%
China: 15%

Asia: 66%
China: 46%

Nickel Product Substitution

- Europe & North America:
  - Nickel scrap units are replacing primary nickel in not only stainless steel, but also in alloyed steel and high nickel alloys where possible.
- China PR:
  - Nickel Pig Iron (NPI) is replacing primary nickel and to some extent stainless steel scrap due to cost and easy availability.
- India:
  - Nickel scrap units are increasing faster than primary nickel in stainless steel.
- Conclusion:
  - The nickel market is changing all the time and currently nickel supply and demand is working differently around the world with China developing the usage of NPI and Europe, India & North America is going the scrap route more and more.

Comments

- What effect will the new nickel projects currently coming on stream and ramping up have on the market?
- Nickel pig iron production and usage in China:
  - what effect would that have on the world nickel market, including ore availability, price and scrap?
- Will nickel remain an attractive investment object and store of value in the future?

ILZSG Overview

- Intergovernmental organization set up within the UN system
- Significant level of industry representation
- Established by UN in 1959 in New York
- Moved to London in 1977
- From start of 2006 ILZSG, ICSG & INSG co-located in Lisbon, Portugal

www.icsg.org

ILZSG

www.insg.org

ILZSG Membership

- Membership open to any country involved in lead and/or zinc production, usage, or trade.
- 30 members (>85% of global lead/zinc industry):


Australia


Belgium


Brazil


Bulgaria


Canada


China


Finland


France


Germany


India


Iran


Ireland


Italy


Japan


Korea Rep.


Mexico


Morocco


Namibia


Netherlands


Norway


Peru


Poland


Portugal


Russian Fed.


Serbia


South Africa


Sweden


Thailand


United States


European Community

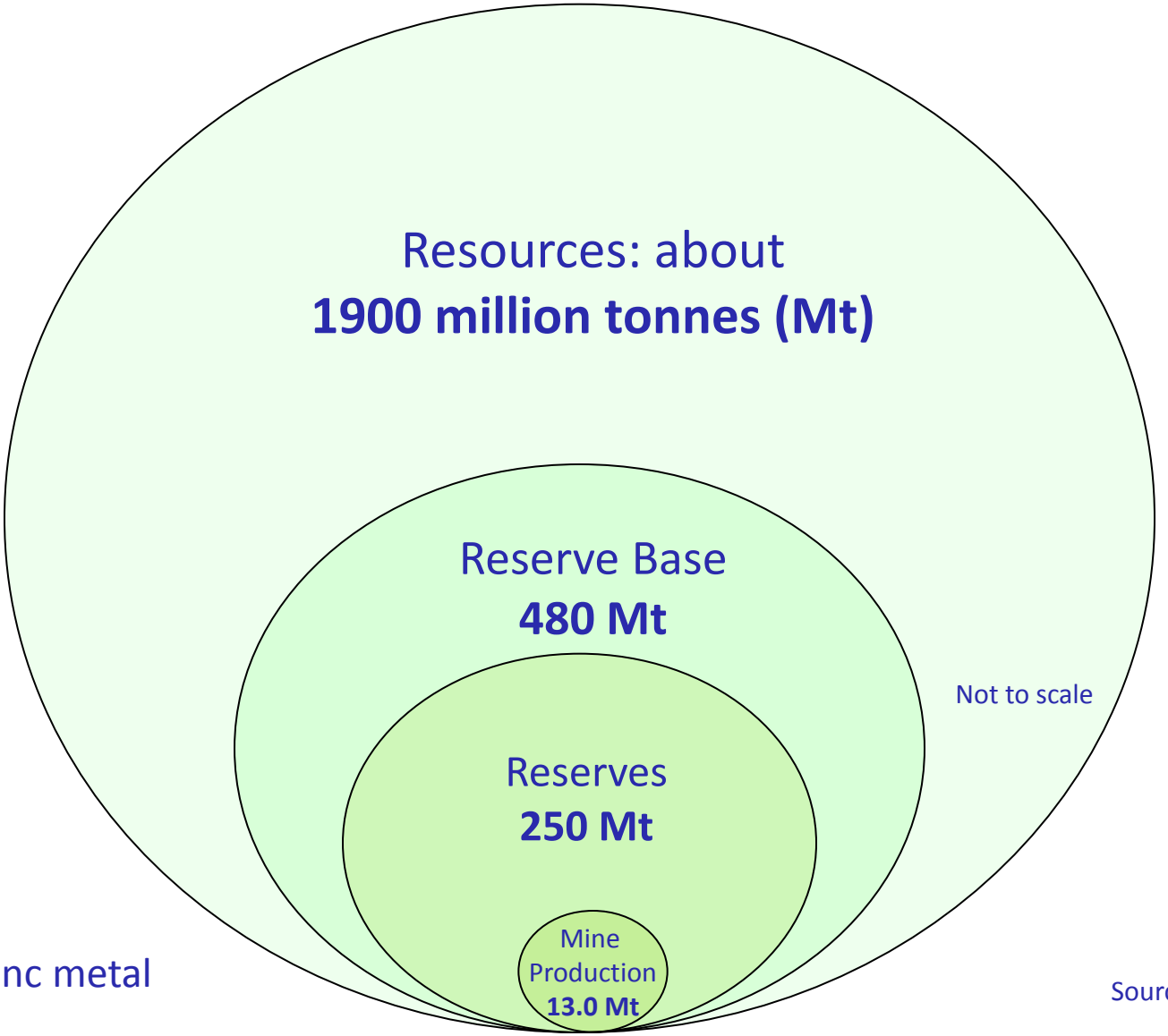
ILZSG Main Publications

50% Discount

For companies based in member countries

- **Lead and Zinc Statistics: ILZSG's Monthly Statistical Bulletin**
- **Lead and Zinc New Mine and Smelter Projects 2013**
- **Study on Chinese Zn First Use Market 2012**
- **The By-Products of Copper, Zinc, Lead and Nickel**
- **Indian Lead Market 2012**
- **The Market for Lead: Fundamentals Driving Change 2012**
- **World Directory: Primary and Secondary Lead Plants 2011**
- **Environment and Health Controls on Lead 2011**
- **Environment and Health Controls on Zinc 2011**
- **China Lead Acid Battery Market** (prepared for ILZSG by BGRIMM)
- **China Zinc Recycling Industry** (prepared for ILZSG by BGRIMM)

World Zinc Reserves 2011



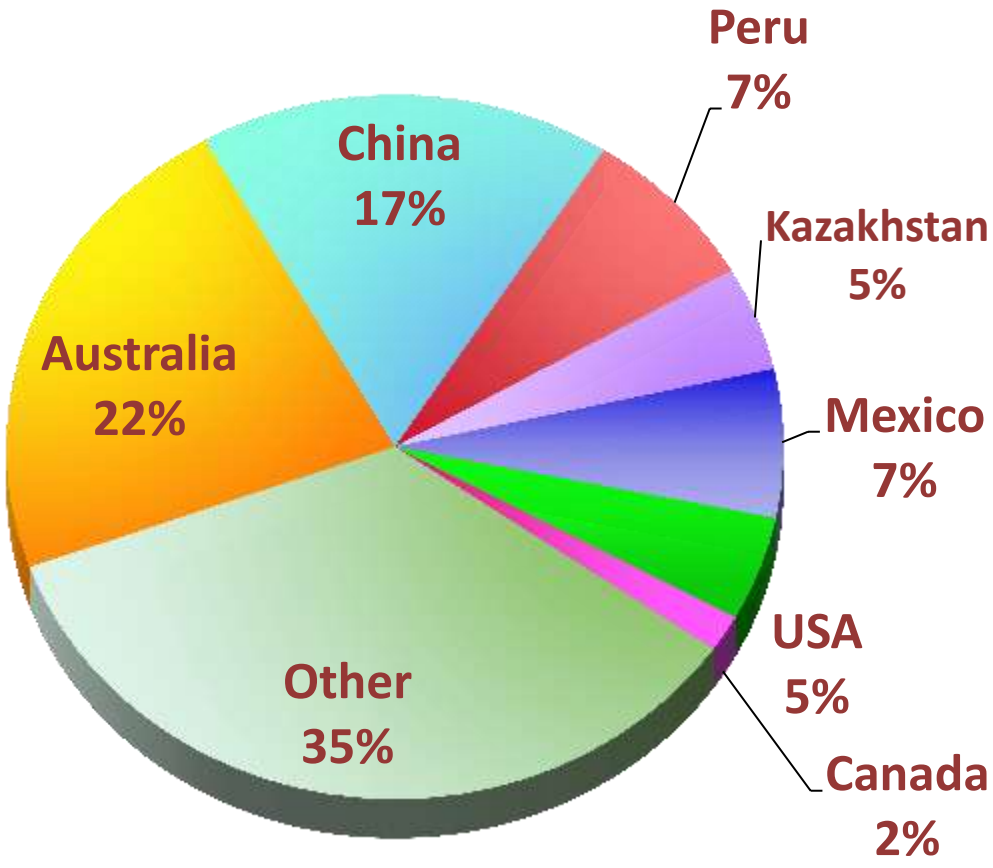
contained zinc metal

Sources: USGS, ILZSG

World Zinc Reserves
2011 Breakdown

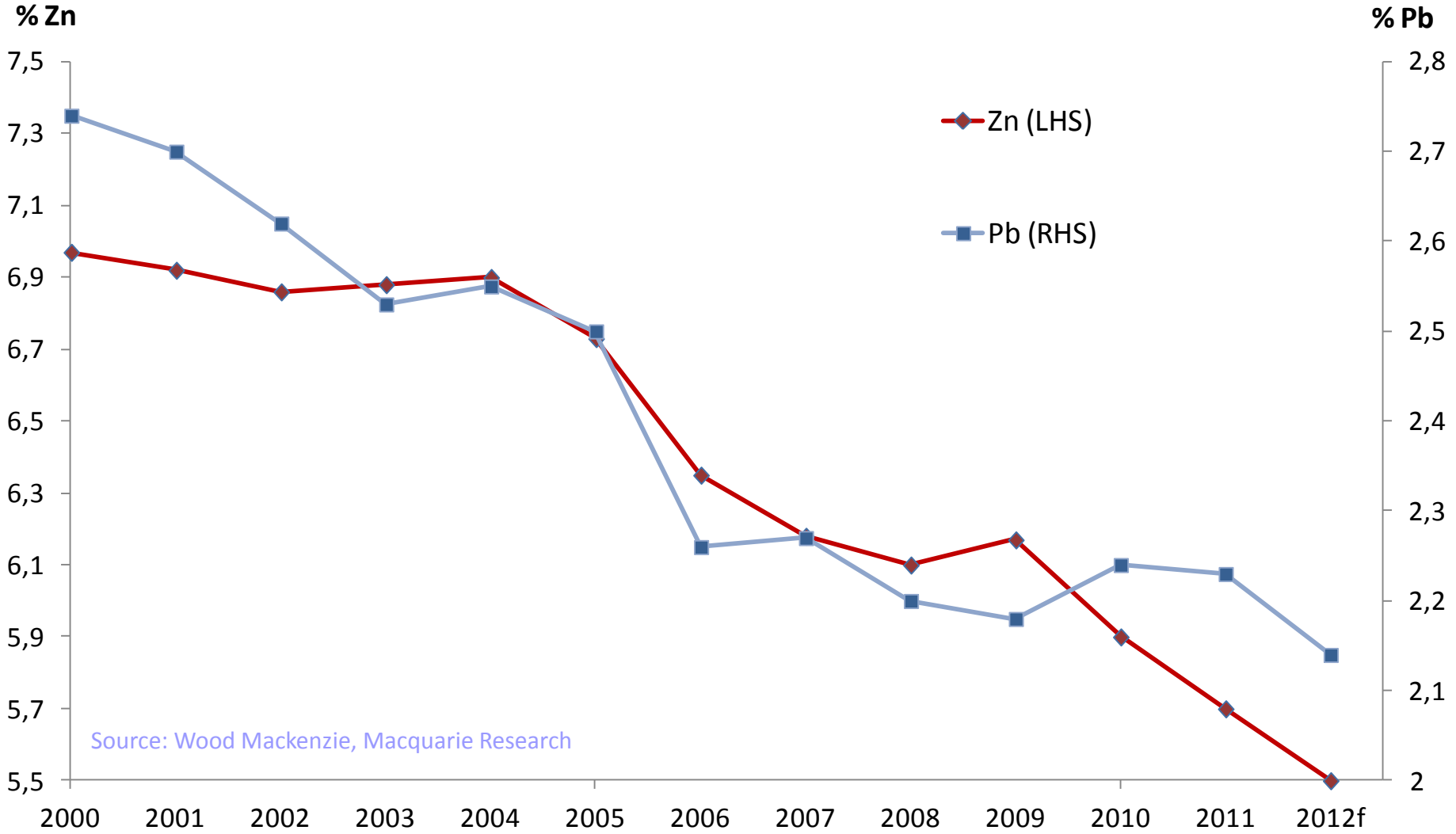
Source: USGS

- Despite increased consumption of zinc produced from ore in recent years, increases in reserves have grown more, and there is more zinc available to the world than at any other time in the past.



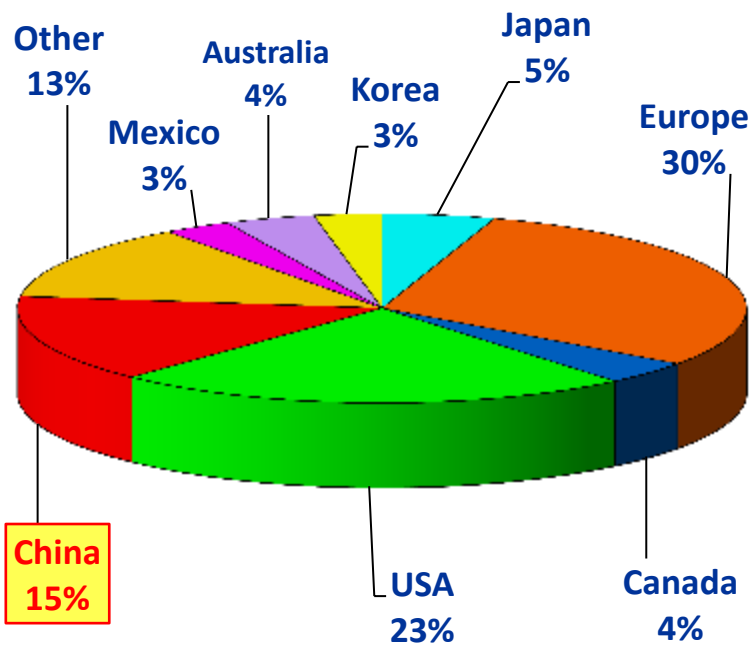
Mexico accounts for 7% of World Zinc Reserves

Falling Lead and Zinc Mine Grades

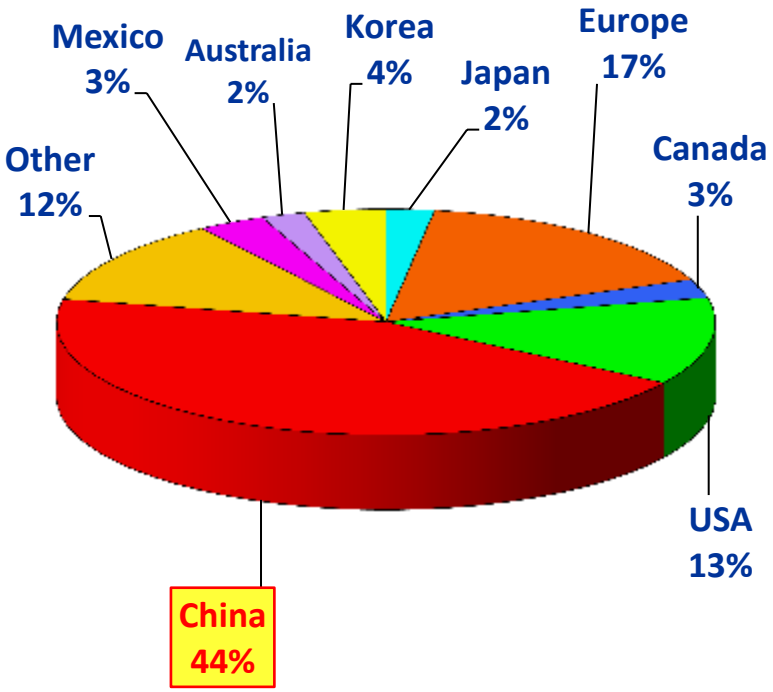


Distribution of Lead Metal Supply

2001



2011



Source: ILZSG

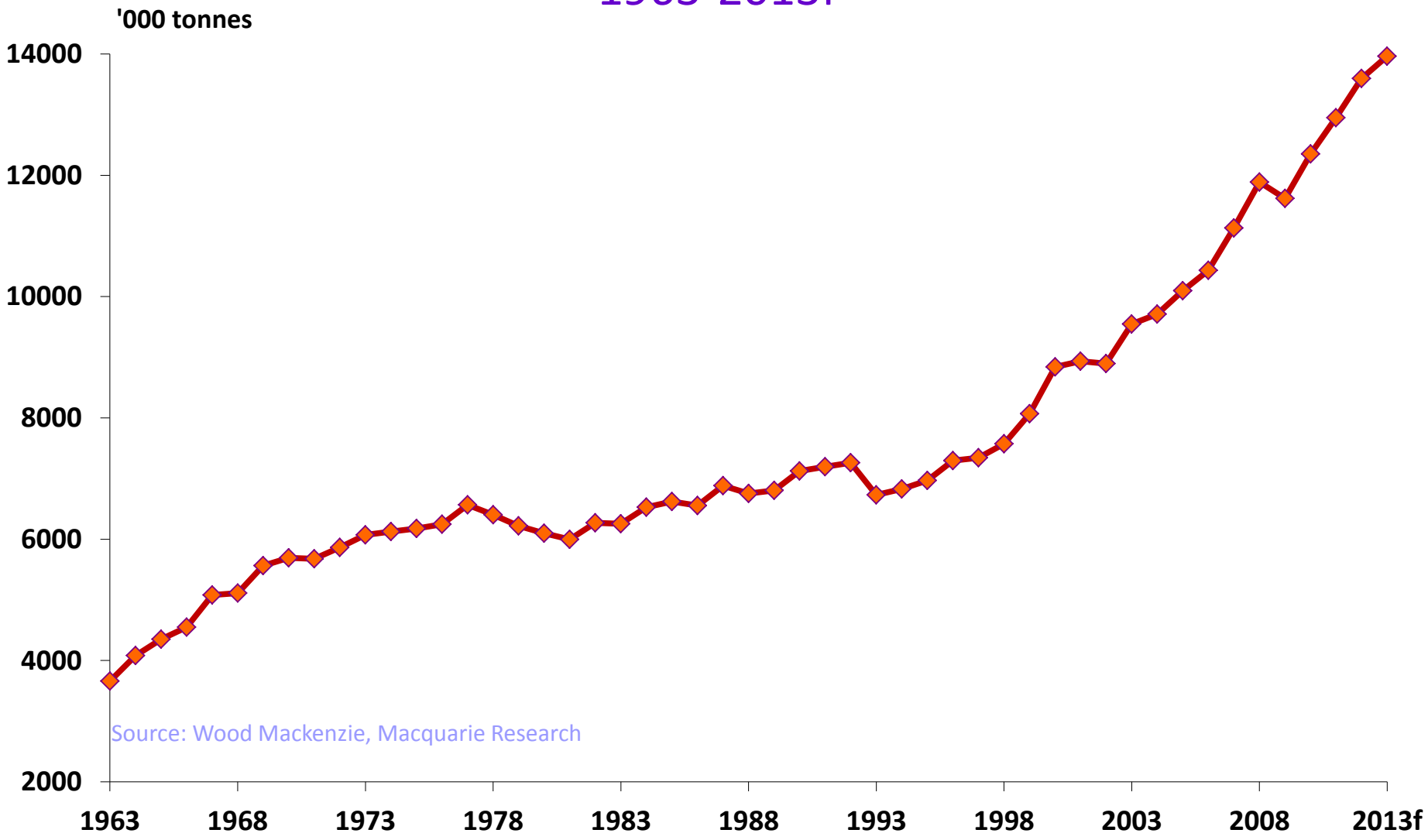
Selected Lead Mine Openings/Expansions 2012 to 2014 (Committed* and Under Consideration)

Source: New Mines and Smelters 2013 Report, ILZSG

Mine	Annual Capacity (Pb metal contained)	Open
George Fisher, Australia*	120,000t	2012 *(36kt expansion)*
Magellan, Australia*	85,000t	2013 *(reopening)*
Potosi , Australia*	14,000t	2012 *(new)*
Keke Tale, China*	15,000t	2012 *(new)*
Kayar, India*	15,000t	2013 *(new)*
Garpenburg, Sweden*	50,000t	2012 *(20kt expansion)*
Tala Hamza, Algeria	36,000t	
Admiral Bay, Australia	350,000t	
Browns Oxide Project, Australia	70,000t	
Browns Sulphide Project, Australia	150,000t	
McArthur River (expansion), Australia	93,000t	
Mount Isa Super Pit, Australia	200,000t	

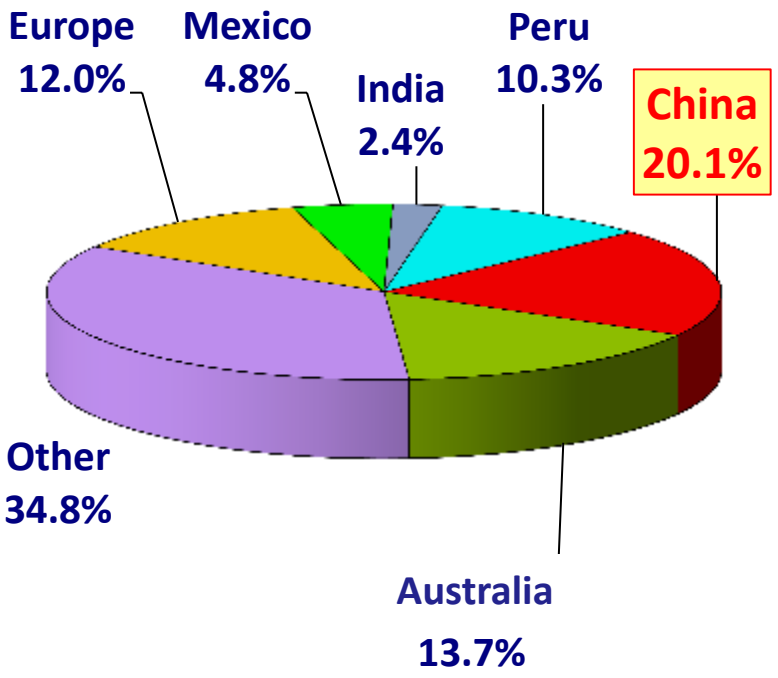
Zinc Mine Supply

1963-2013f

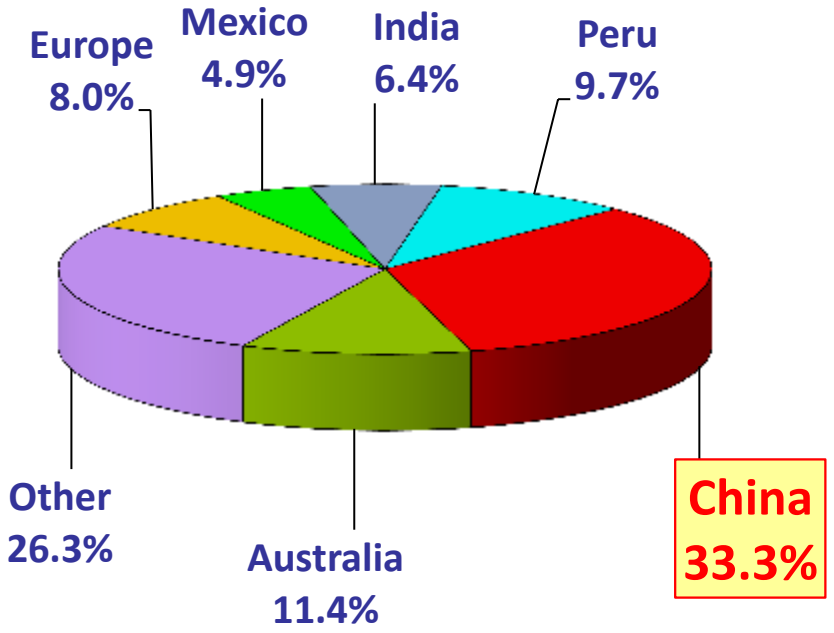


Distribution of Zinc Mine Supply

2001



2011



Source: ILZSG

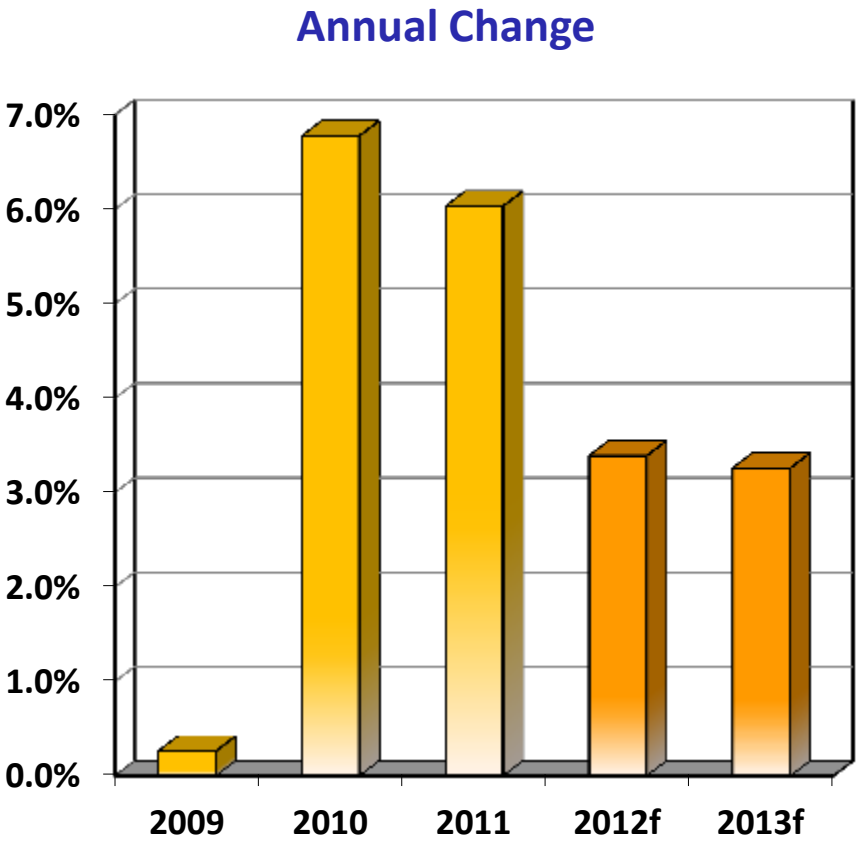
Selected Zinc Mine Openings/Expansions
2012 to 2014 (Committed* and Under Consideration)

Mine	Annual Capacity	Open
Source: New Mines and Smelters 2013 Report, ILZSG	Zn Metal contained	
George Fisher, Australia*	215,000t	2012 *(64kt expansion)*
Perkoa, Burkina Faso*	95,000t	2013 *(new)*
Bracemac-McLeod, Canada*	90,000t	2013 *(new)*
Keke Tale, China*	40,000t	2012 *(new)*
Valardena, Mexico*	90,000t	2013 *(reactivation)*
Garpenburg, Sweden*	50,000t	2012 *(20kt expansion)*
Tala Hamza, Algeria	164,000t	
Admiral Bay, Australia	450,000t	
Dugald River, Australia	200,000t	
McArthur River (expansion), Australia	380,000t	
Mount Isa Super Pit, Australia	300,000t	
Panorama, Australia	185,000t	
Gamsburg, South Africa	350,000t	
Ozernoye, Russia	350,000t	

World Lead Demand Forecast

ILZSG Forecast

- **2012 3.4 %**
- **2013 3,3%**

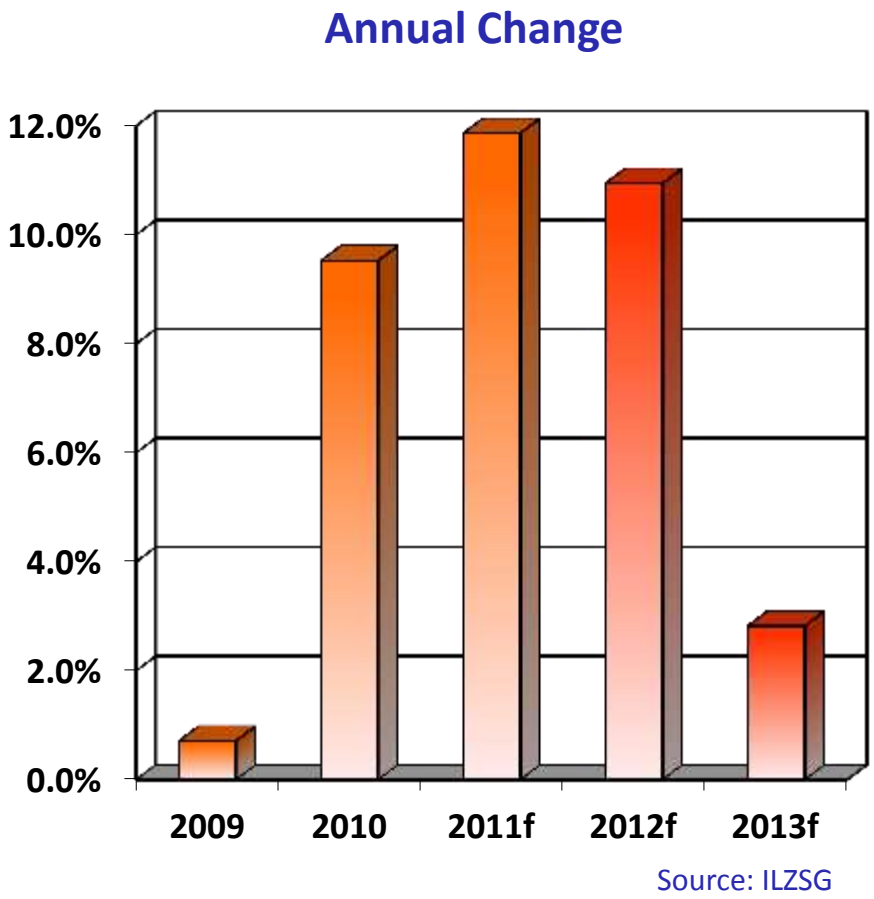


Source: ILZSG

World Lead Mine Supply Forecast

ILZSG Forecast

- **2012 10.9 %**
- **2013 2.8%**

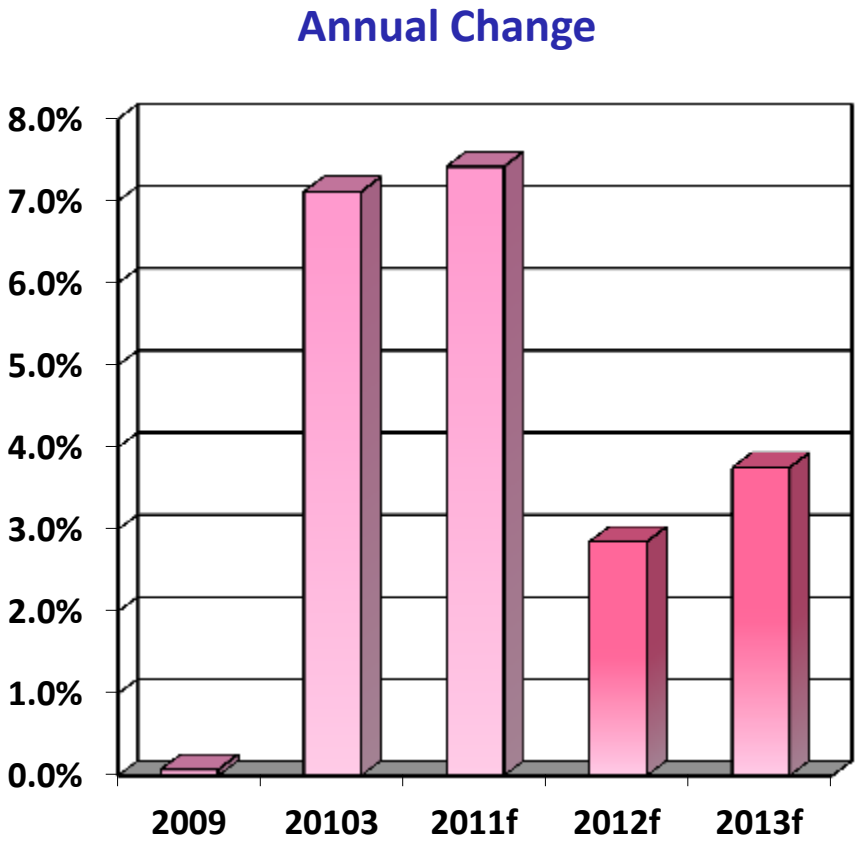


Source: ILZSG

World Lead Metal Supply Forecast

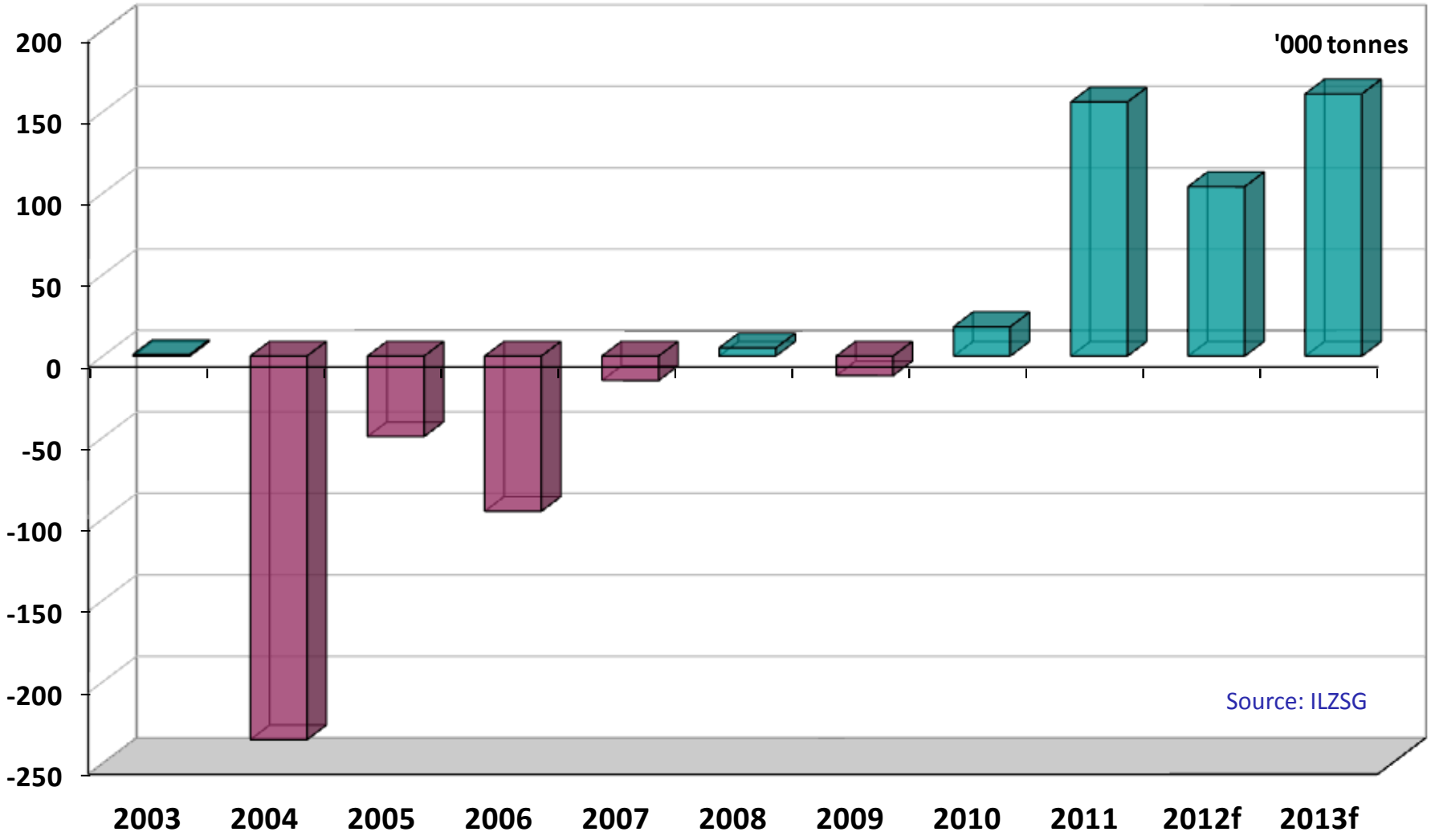
ILZSG Forecast

- **2012 2.9 %**
- **2013 3,8%**



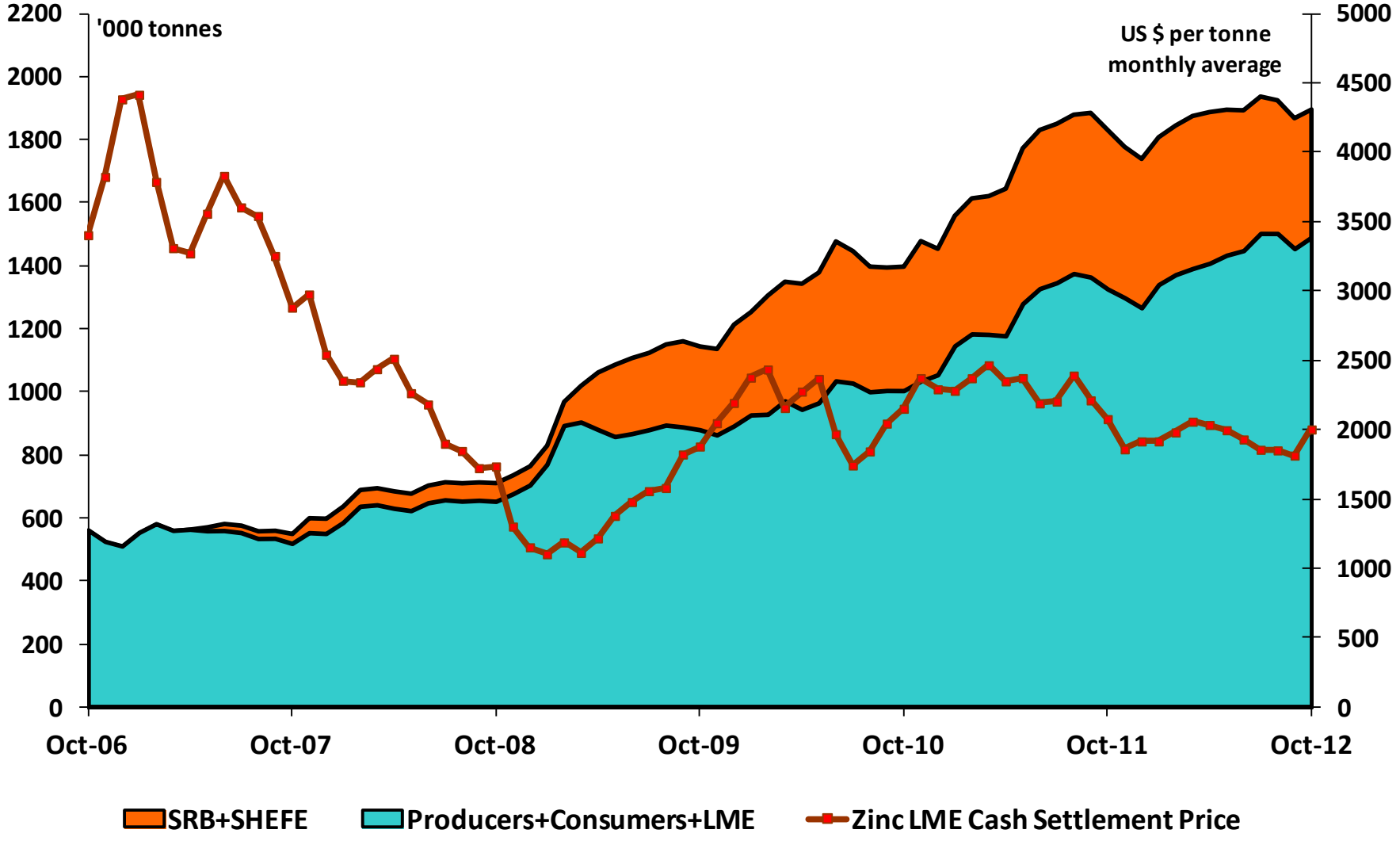
Source: ILZSG

Lead Metal World Balance



Zinc Stocks and Prices

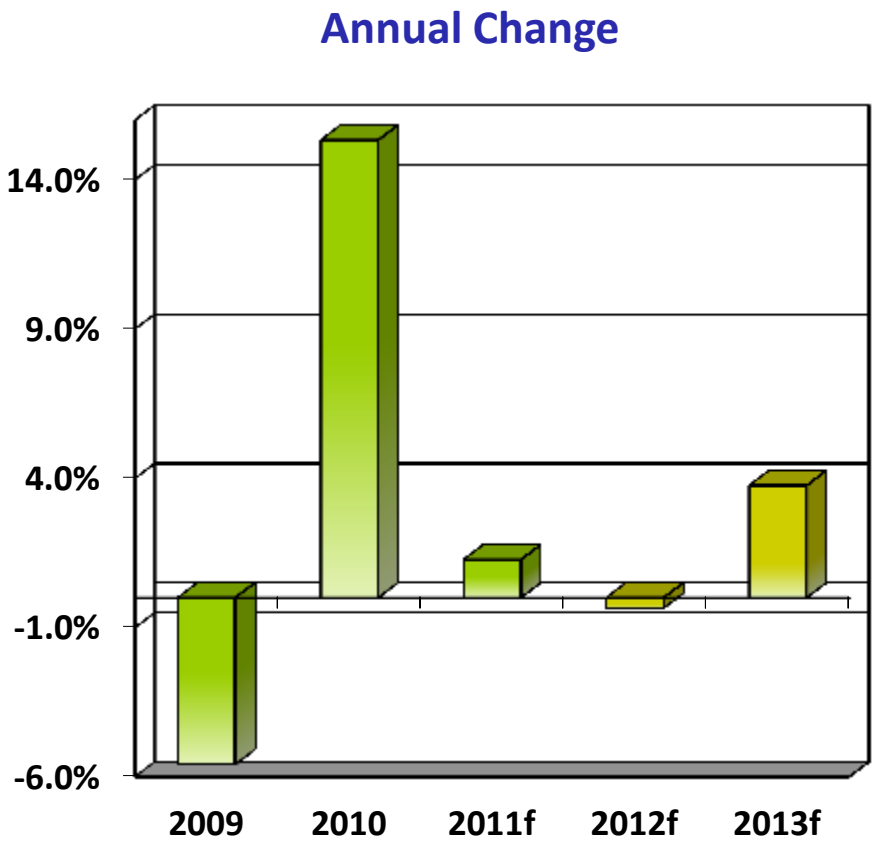
Oct 2006 – Oct 2012



World Zinc Metal Demand Forecast

ILZSG Forecast

- **2012 –0.3 %**
- **2013 3.8%**

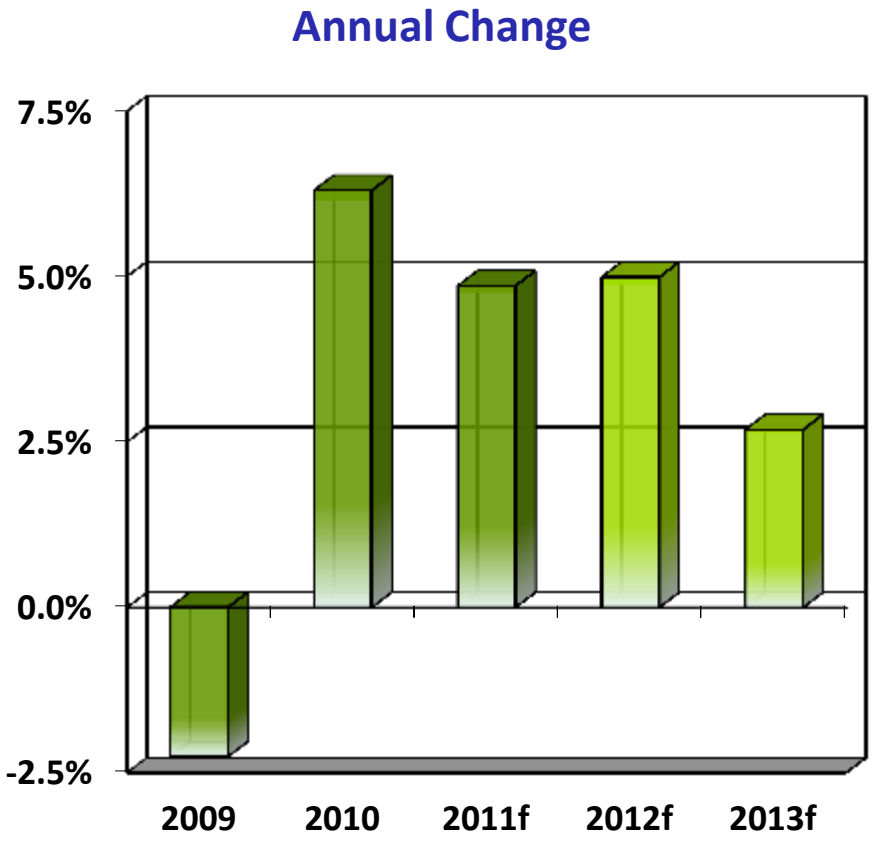


Source: ILZSG

World Zinc Mine Supply Forecast

ILZSG Forecast

- **2012 5.0 %**
- **2013 2.7%**

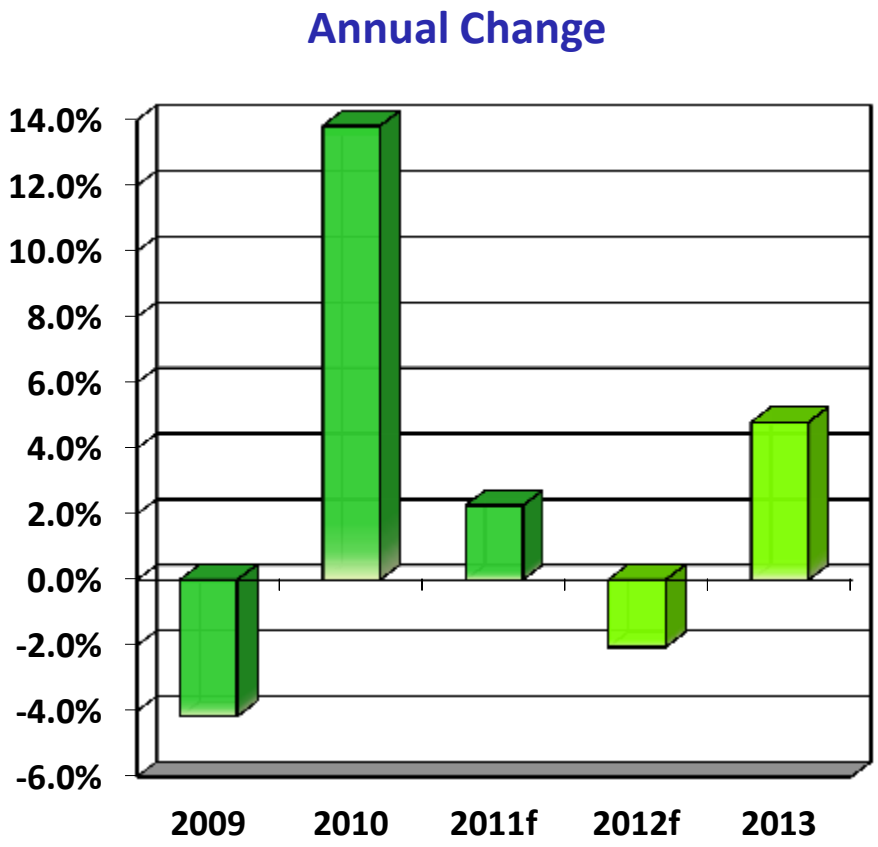


Source: ILZSG

World Zinc Metal Supply Forecast

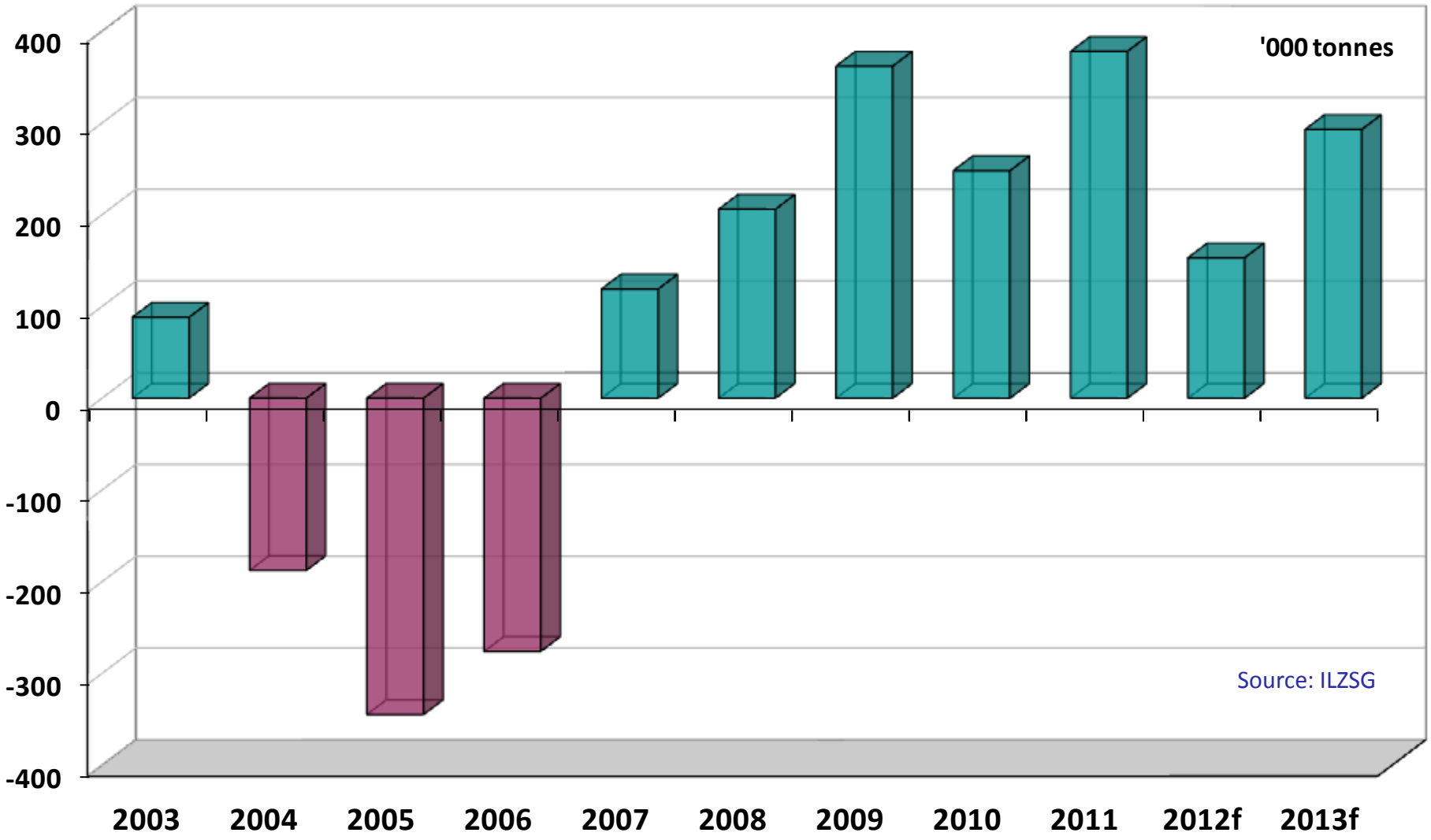
ILZSG Forecast

- **2012 –2.0 %**
- **2013 4.8%**



Source: ILZSG

Zinc Metal World Balance



Next Study Group Meetings in Lisbon, Portugal

• 22-23 April 2013	International Nickel Study Group
• Morning 24 April 2013	International Lead and Zinc Study Group
• 2.00pm 24 April 2013	Joint Study Groups Seminar *"Financial Aspects of the Metals Industry: Price Volatility, Investor Activity and Project Financing"*
• 25-26 April 2013	International Copper Study Group