



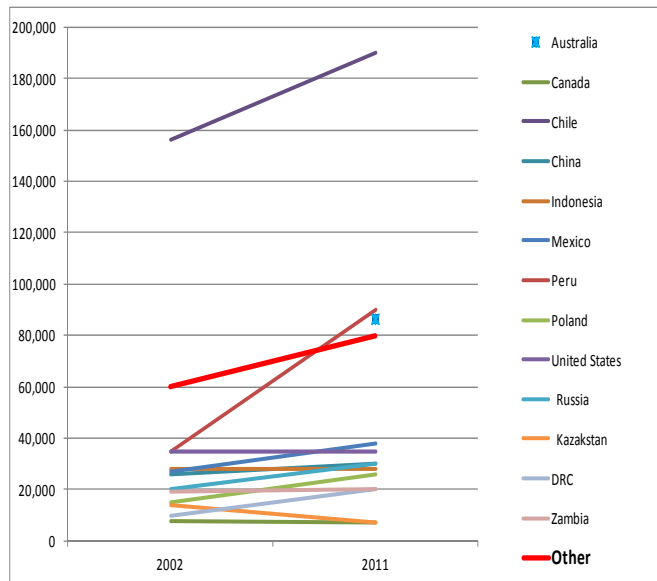
Short Overview of the Emerging Countries in Copper Mining Geographical Enlargement of the Copper Industry

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World Copper Reserves (USGS, Jan 2012)

in thousand metric tons



- Strong increase in Chile and Peru reserves
- Other "Traditional" countries: small growth or declines
- Significant increase in "Other Countries" reserves



➤ Growing interest in developing copper projects in countries that up to now are not mining copper.

➤ Geographical enlargement of the copper mining industry: the copper mining industry started to be developed in countries that were not producing copper before or where copper production levels were very low.

➤ We distinguish here three groups of countries:

- ❑ countries where copper mining production only started last decade
- ❑ countries where copper mining is expected to start this decade and/or where exploration is growing
- ❑ countries that had limited copper mine production but are expected to become substantial copper mine suppliers

➤ We can also consider under geographical enlargement the exploration of seabed mineral resources

➤ Data presented here is based on the ICSG Directory of Copper Mines and Plants published in February 2012. Detailed data on a mine by mine basis can be found in the Directory.

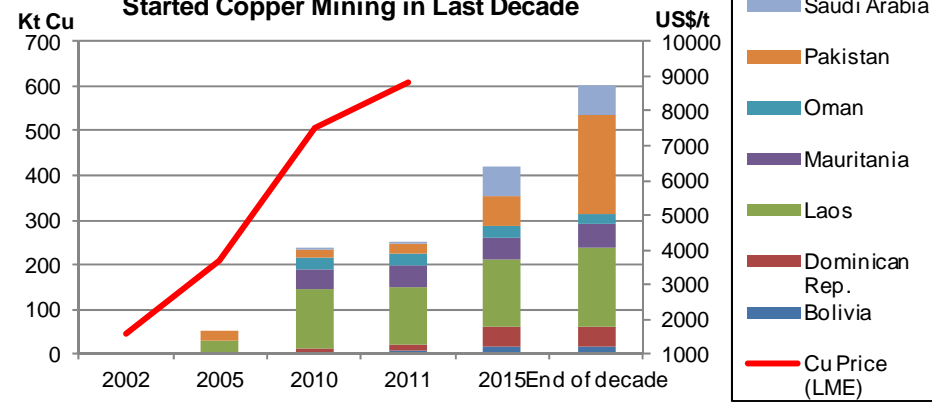
NOTE: Kt= Thousand Tons, Mt = Million Tons, SX-EW = Solvent Extraction-Electrowinning

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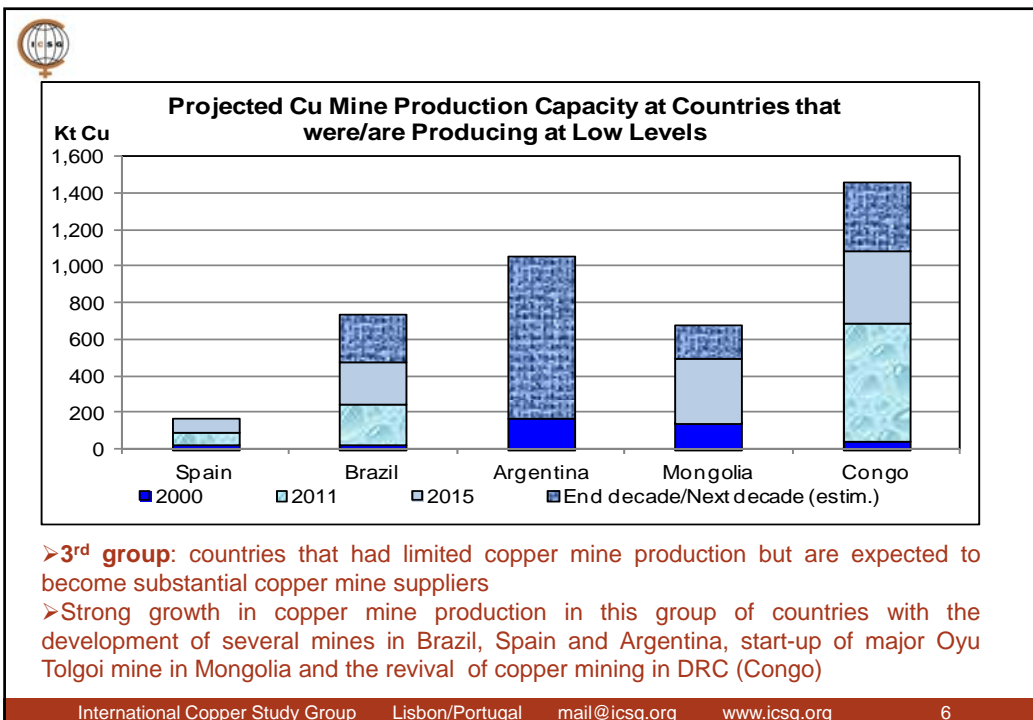
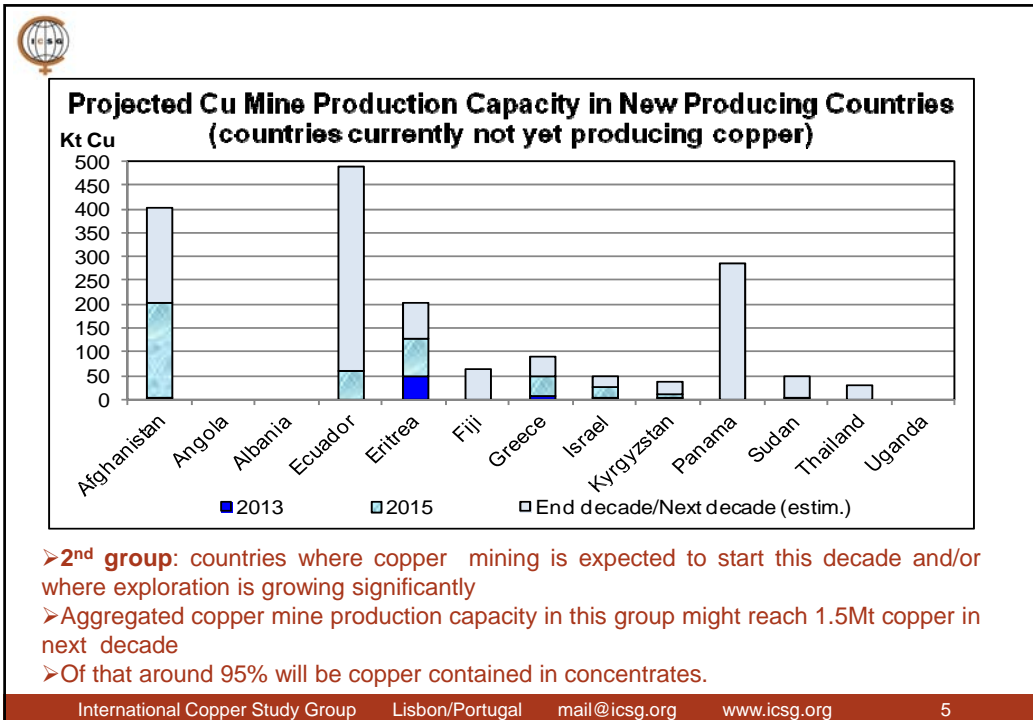
Projected Cu Mine Production Capacity at Countries that Started Copper Mining in Last Decade



- **1st group:** countries where copper production only started last decade
- Aggregated copper mine production capacity in this group of countries grew from zero in 2002 to around 300 Kt/yr of copper in 2012 and is expected to reach 600 Kt
- Of that, around 87% will be copper contained in concentrates

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➤ Looking into the future and similar to what happened in the oil industry years ago, mining companies are starting now to look at possible offshore deep-sea minerals exploration.

➤ The oceans represent around 70% of the world surface and its floor is believed to contain important mineral resources among which are copper, zinc, nickel, manganese, gold and silver.

➤ To meet increasing copper demand, the discovery and exploration of new resources will be crucial and sea floor deposits could represent an important opportunity for additional supply.

➤ However, the challenge is to be able to exploit those deposits efficiently and turn them into economically-viable operations

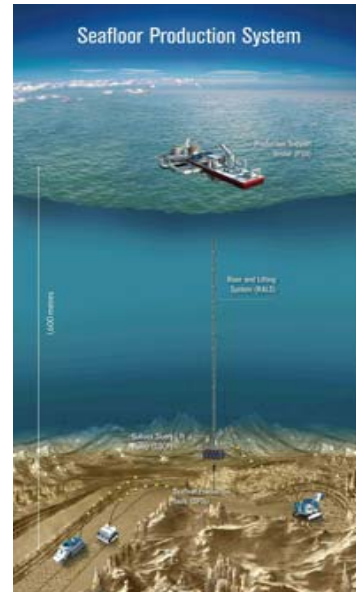


Photo: Nautilus Minerals Inc website



Conclusion points

➤ To meet increasing copper demand, the development of new resources will be crucial

➤ We are witnessing a geographical enlargement of the copper mining industry

➤ Exploration in emerging countries has increased considerably that is likely to culminate in additional supply.

➤ Challenges in bringing on-stream supply in countries with low mining tradition are higher

➤ It has become a priority for certain governments to develop their mineral resources that have not been exploited until now. While willing to develop their natural resources, countries might be seeking to extract strong revenue flows from them. It will be important to balance royalty/taxation levels with the need to encourage capital investment to develop their rising industries.

➤ Sea floor deposits could represent an opportunity for additional copper supply.

➤ Most of the projects will be producing concentrates

➤ Potential to increase capacity in “traditional” copper mining countries such as Peru, Chile and the United States but attention should be focused as well in the growth potential of copper mining in emerging countries