

# Boring Metals Make Money



**Guest Lecture for 590Y MINE PRJ ECONMC Class**  
**Wednesday 12 March 2014**

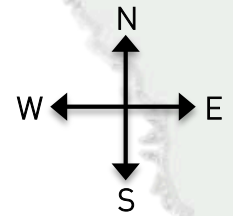


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# Who is Benjamin Cox?



Aston Bay



Somerset  
Island

Baffin Bay

Greenland

## Diverse background in mining & finance:

- D.E. Shaw: Hedge fund
- Linux Fund: Open-source technology



Roche Bay  
Hall Beach

Baffin  
Island

Davis  
Strait

Nunavut, Canada

Foxe  
Basin



**CEO, Director**

Copper and zinc

Near surface, +1% average intersections



**Founder, MD**

Equity finance data and research

Sector, broker analysis



**CEO, Director**

Iron ore

Multiple JV partners

# Oreninc's Commodity Philosophy

1. **Focus on a commodity that you like, understand, and have faith in**
2. **Quality commodities have:**
  - Supply constraints
  - Inelastic demand
  - A lack of quality pipeline projects
  - A foreseeable shutdown in major mines
3. **Oreninc likes zinc, copper, coking coal, iron ore, and nickel**



# Naturally Scarce vs. Metallurgically Scarce

We like to talk about two different types of supply-side scarcity.

We know how to mine it,  
but we can't find it.

**NATURAL  
SCARCITY**

**VS.**

We can find it,  
but we can't process it.

**METALLURGICAL  
SCARCITY**

**The scarcities are not mutually exclusive.**

# Charged Core Beliefs

## Anticipate Growth for Base Metals (Copper) Demand:

- China is building more expensive infrastructure vs. more bulk (as they have done in the past)
- U.S. and Europe are not going to be in a recession forever
- Supply growth in the medium- and long-term is capped – grades are going down and new projects are scarce

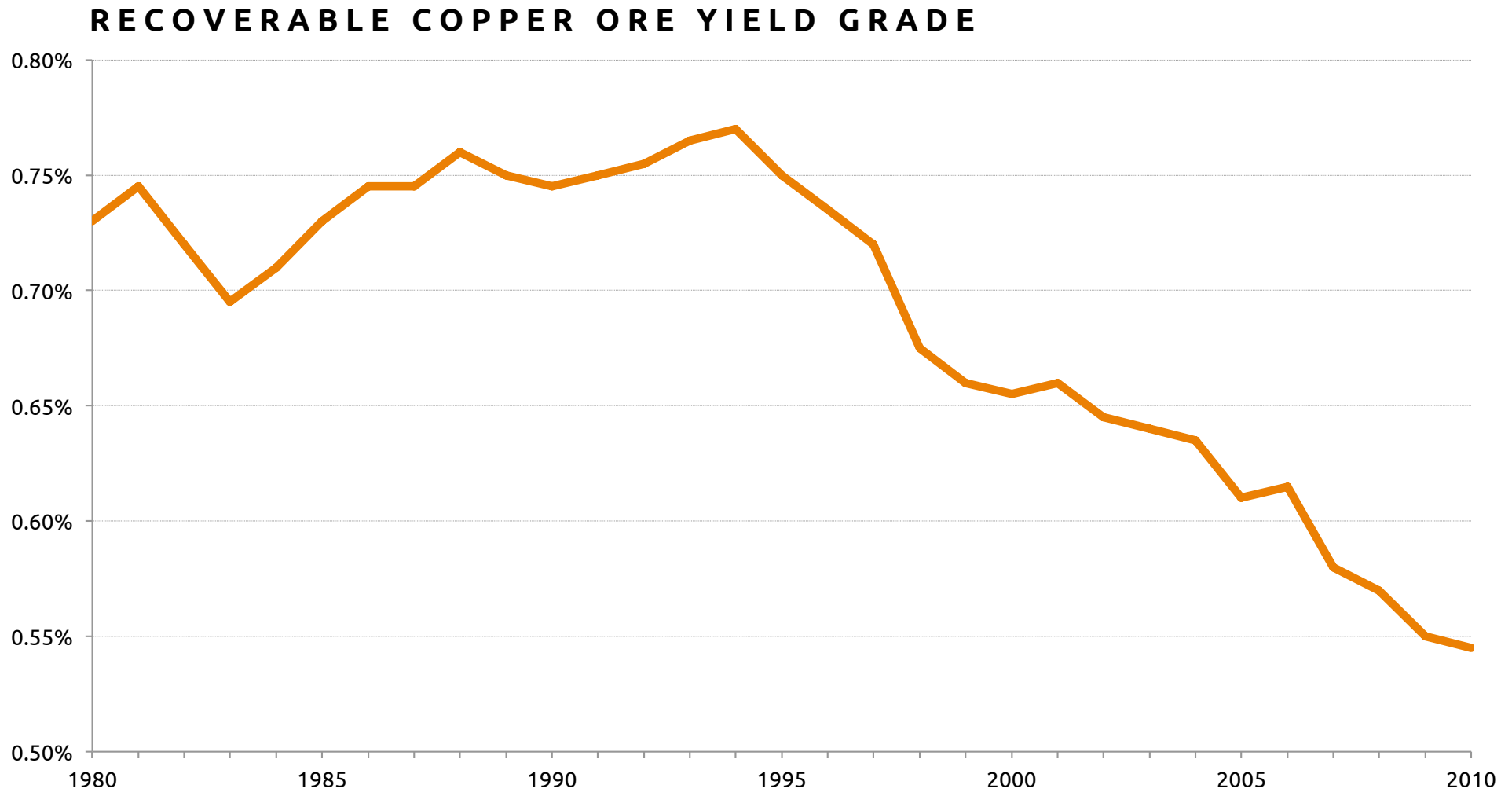
**Given \$5.00/lb. Cu:**

Long-Term  
**Supply** Growth

≠

Long-Term  
**Demand** Growth

# Not Making The Grade



Source: Barclays Capital, as of 12/31/10.

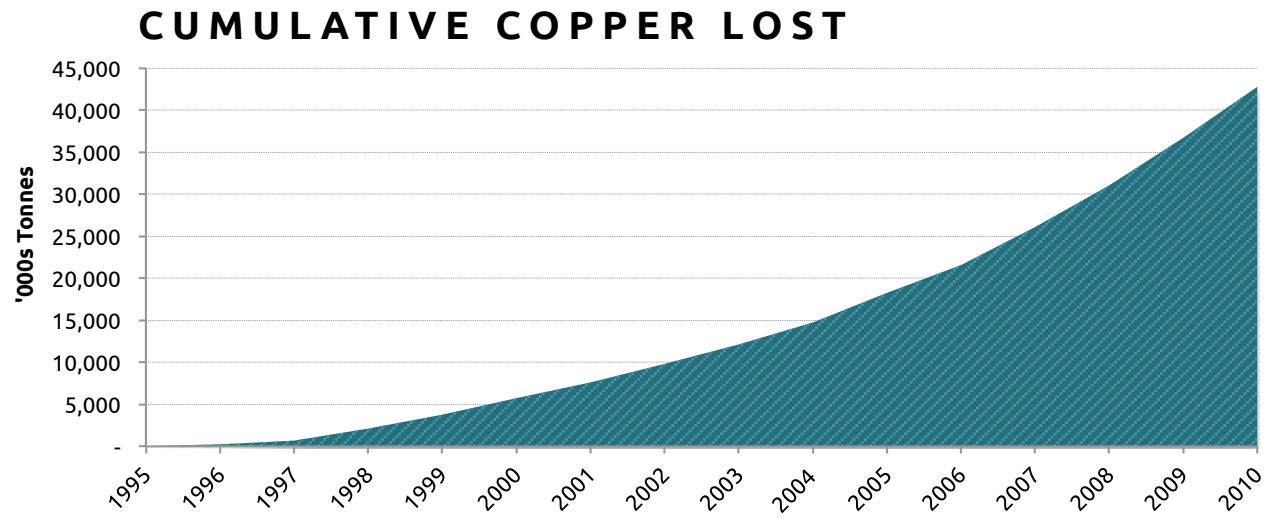
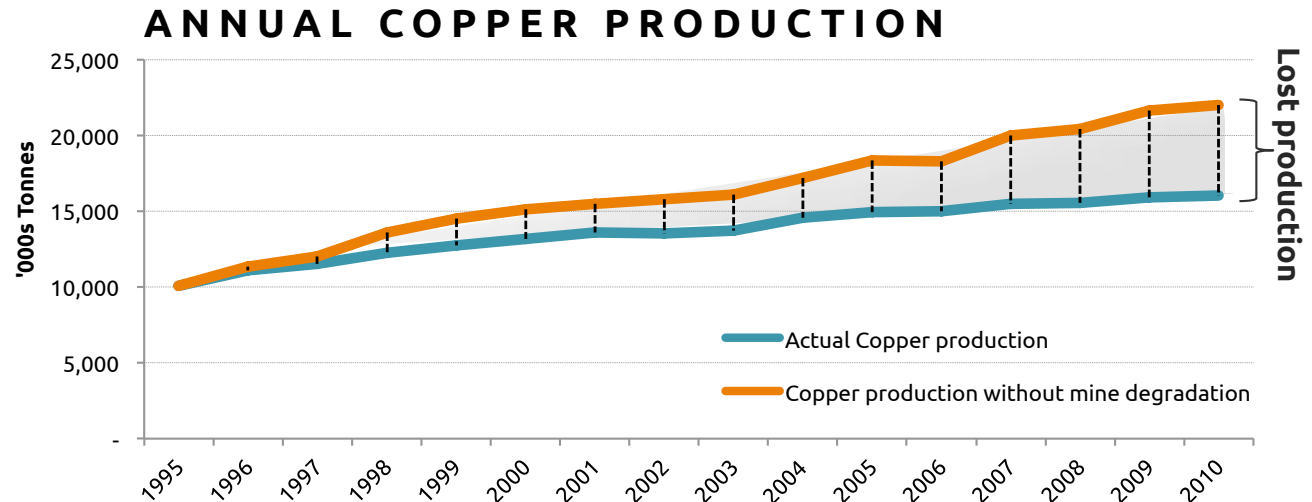


# 40 Million Tonnes Of Copper Is Gone

Between 1995 and 2010, total copper supply lost nearly 43 million tonnes due to mine grade degradation

- China AND India's refined copper usage from 2007-2012: **43.3m tonnes**
- U.S. refined copper usage from 1994-2012: **41.8m tonnes**

High-grade copper has left the building and isn't making a comeback



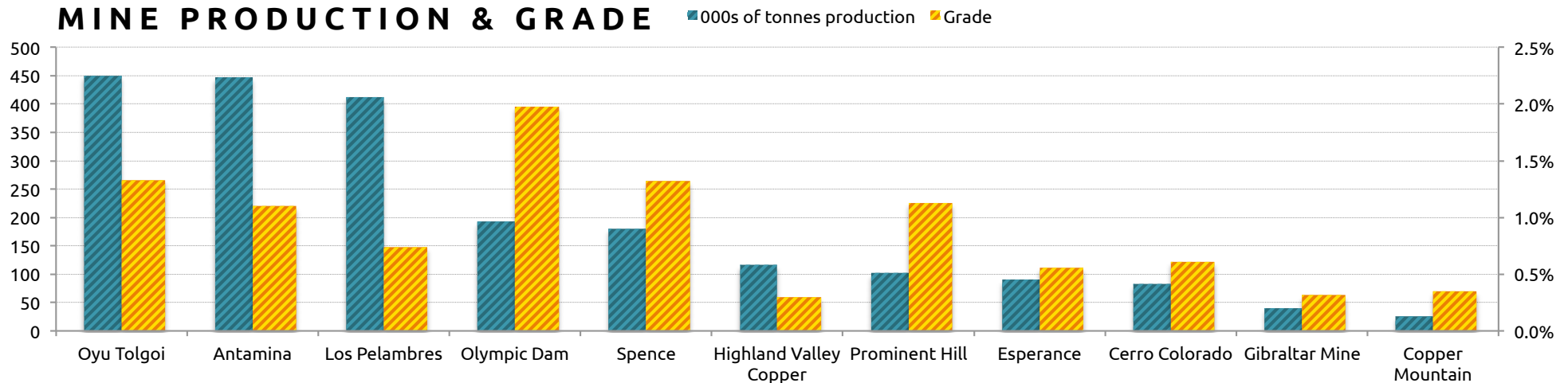
Source: Some data derived from International Copper Study Group.

# Country Risk, Meets Grades, Meets NIMBY

1. Declining ore grades and mature mines
2. No major new discoveries
3. Political risk of new projects
4. NIMBYism



## MINE PRODUCTION & GRADE



**Note:** For copper production to grow at 2% per annum, two new mines nearly the size of Oyu Tolgoi would need to open every three years. For an annual growth rate equal to steel's growth over the last decade (5%), there would need to be new mines with production capacity equal to the combined production of Los Pelambros, Olympic Dam, Highland Valley and Cerro Colorado going online every year. Oyu Tolgoi is the only mine of its size and quality in the production pipeline. Mine production and grade derived from public documents as at May, 31, 2013.



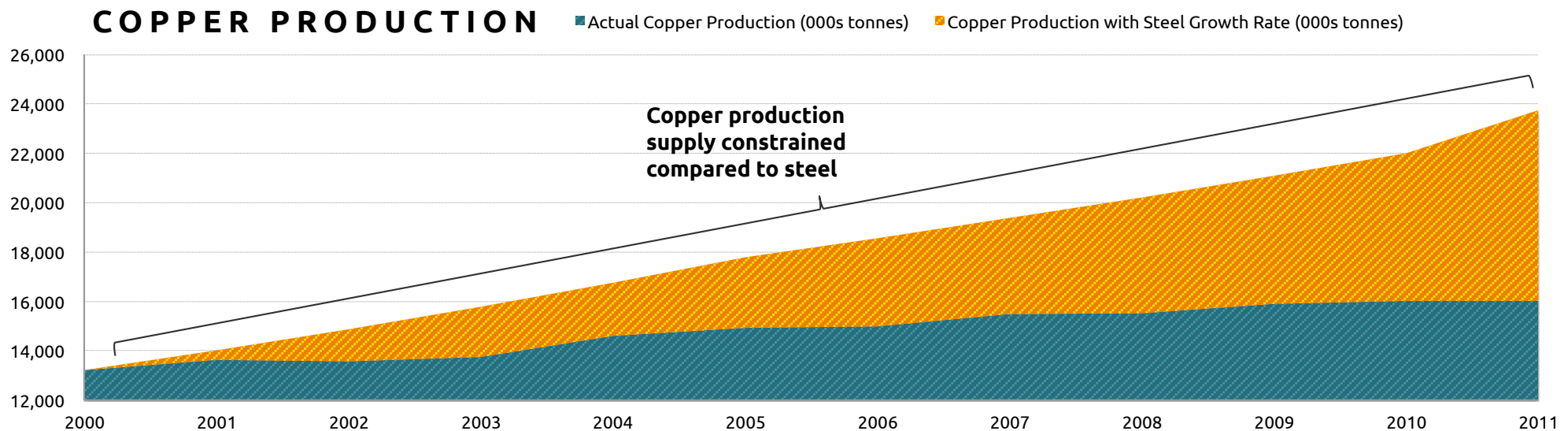
# Under-Wiring Asia...Blackouts Anyone?

**Current annual mined copper production is around 16 million tonnes**

- Supply growth is constrained by declining mine grades, smaller new resources and significantly more complex ore bodies, both geologically and politically

**From 2001 to 2011, average growth of global supply was roughly 1.8% (as compared to steel, which is growing at 5.5%)**

- If copper supply was easily scalable, copper and steel production growth would be more correlated based on infrastructure and development needs



**Note:** The chart above shows actual copper production and theoretical copper production with steel growth rates from 2000 to 2011, copper production data from International Copper Study Group .



# Development Is A One-Way Street

**No one gives up their refrigerator once they have one, and the number of owners increases every day**

**Cell phone communications are available in practically every country in the world**

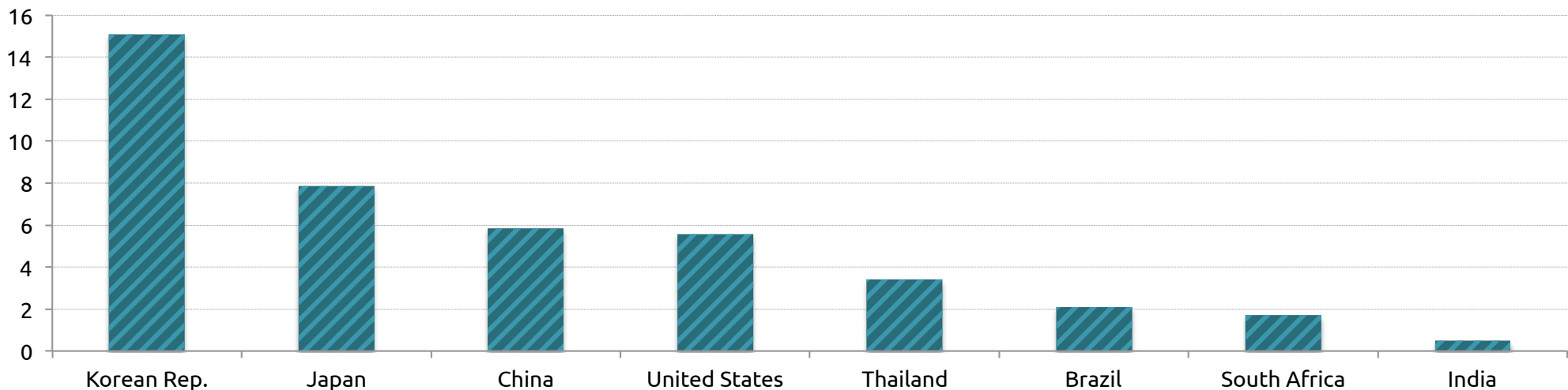
- Cell phone subscriptions per 100 inhabitants in developing countries has grown from 23 to 90 from 2005 to 2013<sup>1</sup>

Note: (1) <http://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx>

# Long-Term Demand Growth

1. **Inelastic demand: Copper is needed in all new modern products from buildings to cell phones – the price is not the driving factor in new purchases.**
2. **Expectations of long-term continued global growth and development – Brazil and India's demand will only go up on a per capita basis.**
3. **China is building out the country and is still a net-exporter of copper in product, while the United States is maintaining and is a net-importer of copper in product.**

## KILOGRAMS OF COPPER PER CAPITA



**Note:** The chart above shows kilograms of copper used per capita for a selection of global countries (2011). **Source:** International Copper Study Group.





## Growth Tonnes Needed (In Base Oyu Tolgoi)

2% global demand growth = 396,000 tonnes = 0.88 Oyu Tolgois

3% global demand growth = 594,000 tonnes = 1.3 Oyu Tolgois

4% global demand growth = 792,000 tonnes = 1.75 Oyu Tolgois

5% global demand growth = 990,000 tonnes = 2.2 Oyu Tolgois

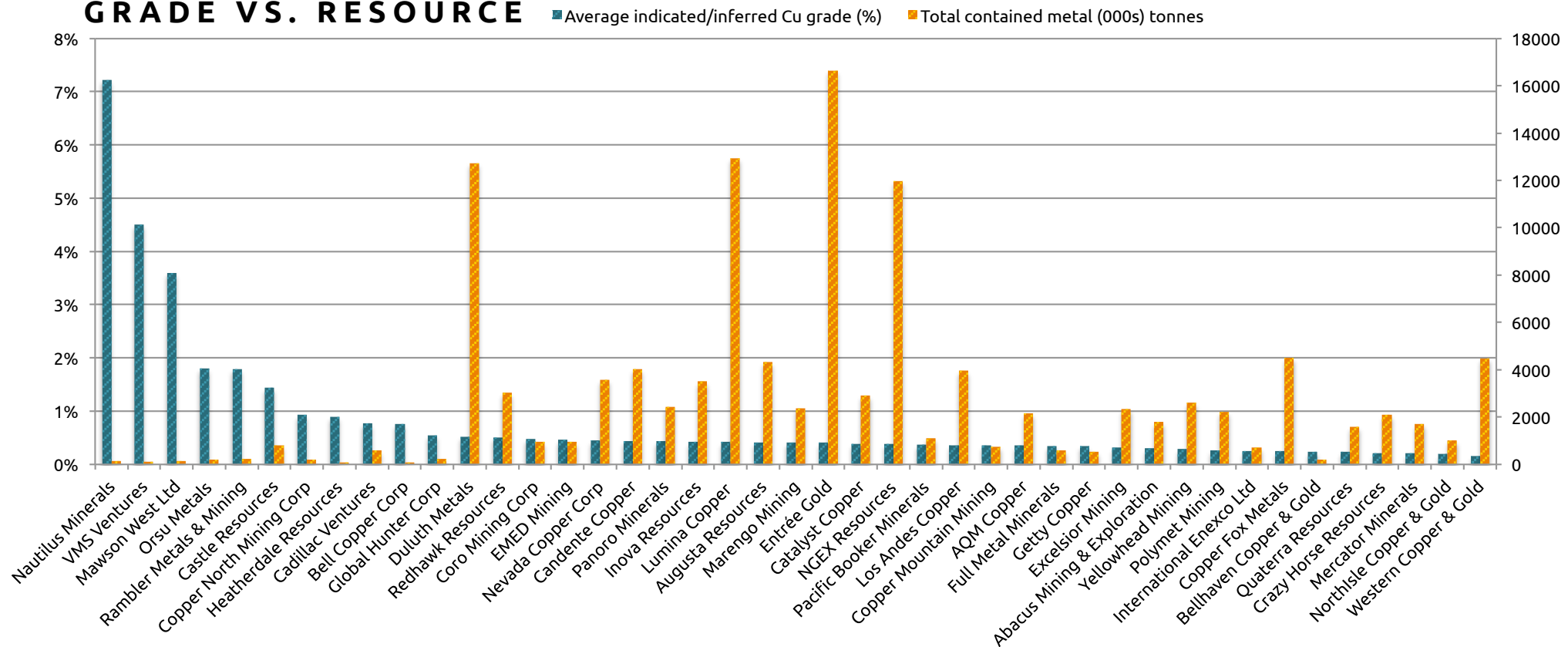
**How many massive discoveries like Oyu Tolgoi are there really?**

# Why Invest In Copper?

## Copper: Low cost supply ≠ demand

- Supply is constrained by lack of new major open-pit mines and declining grades from current producing mines
- Demand is inelastic; we must have copper for apartments, cars, fridges, AC, cell phones, lights, heat, etc.

### GRADE VS. RESOURCE

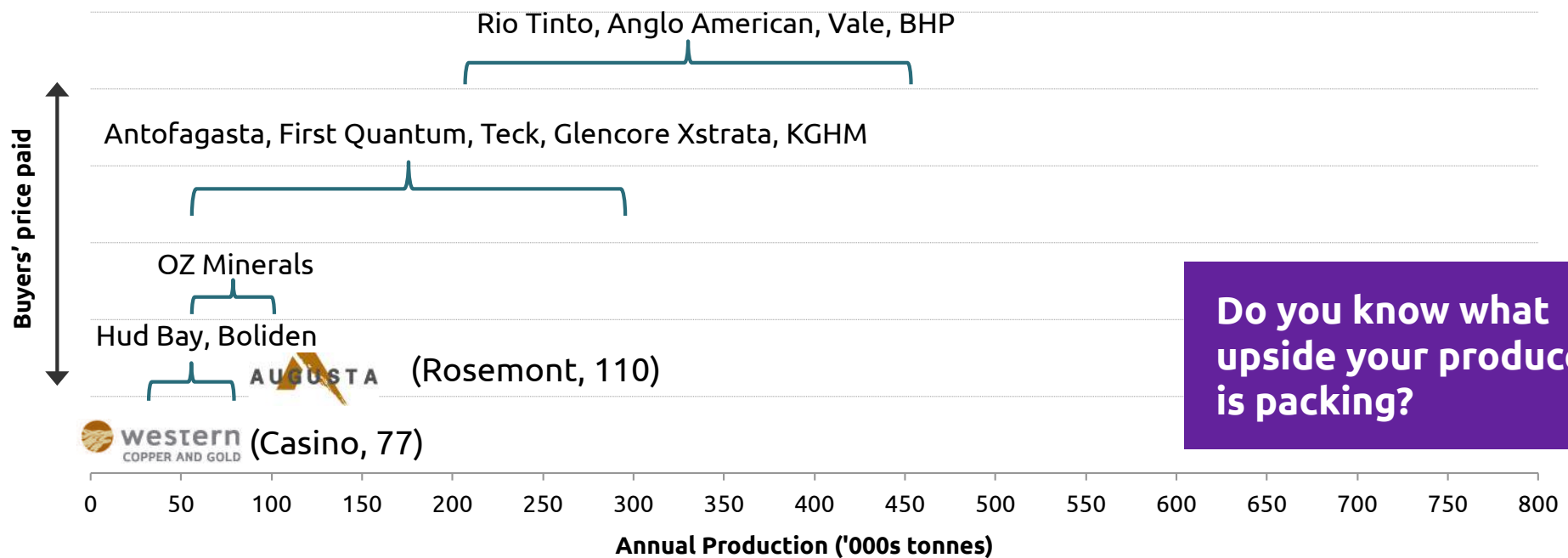


Note: Data extracted from Resource Statements as of August 30, 2013. Source: Oreninc

# “Package” Size Matters To Producers

COMPANY NAME	ANNUAL PRODUCTION	PRICE PAID
Hud Bay, Boliden	25-75	\$
OZ Minerals	50-100	\$\$
Antofagasta, First Quantum, Teck, Glencore Xstrata, KGHM	50-300	\$\$\$
Rio Tinto, Anglo American, Vale, BHP	200-450	\$\$\$\$\$\$\$

## TAKEOVER RANGE VS. ANNUAL PRODUCTION





# The Takeaway

**Short-term pain, long-term joy – there may still be a small market correction, but copper is the base metal on which to be bullish.**

## **1. Global copper supply is limited and becoming more complex**

- Ore bodies are smaller
- Grades are lower
- Political issues abound (from warlords to movie stars)

## **2. Global copper demand will continue to grow**

- Global infrastructure development is continuing and shifting from quantity, to quantity *and* quality
- The global recession will end at some point

## **3. Buyers exist for copper producers at every size**

- Pipeline supply, but not demand, is constrained

## **4. Expect further industrial consolidation in the base metals space**

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Slide 8: Hartmann, Daniela. "Powerlines in Delhi, India." 28 July 2006. < [Slide 10: Goebel, Greg. "Bingham Canyon Mine, west face detail, Utah / 2008." 20 May 2008. <\[March 2014 - Benjamin Cox, Guest Lecture \\(590Y MINE PRJ ECONMC\\): Boring Metals Make Money\]\(http://www.flickr.com/photos/37467370@N08/7639144636/sizes/o/in/photolist-cD3Byh-cD3B7j-cD3HCJ-dweFWI-bdwF8g-cWZNbN-cWZMZf-cWZN35-7DMdMe-bVc6kb-cWZNmm-am6aax-cWZMXN-dymVLe-dyspuS-cwU2dh-dbsGDC-dbsErv-dbsF61-dbsCHO-dbsD9u-dbsEo7-dbsDRb-dbsFW8-dbsDuj-cWZN1L-dwkemh-9kGtqh-cWZNaj-dyspou-dyspkf/></a></p>
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